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JuanCarlos M. Hunt, Esquire
Director, Office of Civil Rights
US Environmental Protection Agency
Office of General Counsel (2310A)
External Civil Rights Compliance Office
1200 Pennsylvania Ave., NW, WCJN Room 2524
Washington, D.C. 20460

Via Certified Mail

Re: Title VI Complaint – The Department of Energy & Environment, Government of the District of Columbia, Mayor Elizabeth Muriel Bowser, District of Columbia, the District of Columbia Department of General Services and the District of Columbia Office of the State Superintendent of Education

Dear Mr. Hunt:

This complaint is filed pursuant to Title VI of the Civil Rights Act of 1964, 42 U.S.C. §§ 2000d to 2000d-7, and 40 C.F.R. Part 7. 40 C.F.R. § 735(b) and (c) that provide:

> **(b)** "A recipient [of EP A financial assistance] shall not use criteria or methods of administering its program which have the effect of subjecting individuals to discrimination because of their race, color, national origin, or sex, or have the effect of defeating or substantially impairing accomplishment of the objectives of the program with respect to individuals of a particular race, color, national origin, or sex."
>
> **(c)** "A recipient [of EP A financial assistance] shall not choose a site or location of a facility that has the purpose or effect of excluding individuals from, denying them the benefits of, or subjecting them to discrimination under any program or activity to which this part applies on the grounds of race, color, or national origin or sex; or with the purpose or effect of defeating or substantially impairing the accomplishment of the objectives of this subpart."

Since the 1950s --- when, due to a Court Decision eliminating restrictive covenants and the Brentwood Neighborhood in Washington, D.C. shifted from all White to mostly Black --- half of the toxic facilities in the District of Columbia (50%) have been located, by Respondents, in one voting area, known as Ward Five. The remedy for that disparate impact and disparate treatment is to equalize where toxic facilities are located; move some out of Ward Five and into the other seven Wards of the District of Columbia. The placement of these toxic facilities in the

Brentwood Neighborhood only began after the Whites moved out and Blacks moved in. None of such facilities are in the predominantly White voting areas of Washington, D.C.

According to the Expert, Sarah Jane Shoenfeld, who has singularly mapped segregation in Washington, D.C.[1] and who certified under oath that, in the 1950s, most of the area south of "W" Street, N.E. --- the Streeet on which the Bus Depot is proposed --- remained undeveloped and owned by the Real Estate & Improvement Co. of Baltimore. This area had been reserved for non-industrial development until the area began to be largely Black-occupied over the course of this decade. In 1958, the area became zoned for heavy/general industrial use below "W" Street and for light manufacturing from about 15th St East to Montana Avenue, directly across "W" Street, upon which Black occupied public housing (Montana Terrace) would be built just a decade later. By 1970, the blocks north of "W" Street were more than 90% Black-occupied. Black households continued to make up the large majority of households along the blocks north of "W" Street.

Complainants will show that the District of Columbia Department of Energy & Environment, District of Columbia Mayor, Muriel Elizabeth Bowser, the District of Columbia Department of General Services and the District of Columbia Office of the State Superintendent of Education, by proposing and seeking to implement a commercial Bus Terminal in the Brentwood Residential Neighborhood, that will house at least 250 buses and 500 personnel, most of whom will drive into an already congested community and park their cars on already congested streets. Moreover, these buses will begin operating at 4:00 a.m. when most Brentwood Residents are yet asleep.

Without proper permitting, according to their Attorneys, the District of Columbia Office of Attorney General, Respondents began construction of the proposed Bus Depot on 21 December 2021, less than 180 days from the instant date. The backdrop to that start day is more revealing.

On 1 November 2019, Mr. Wayne Gore with the D.C. Department of General Services stated:

"In preparation for the project, the A/E team conducted an environmental impact study for internal use. **As part of the building permit process, all applicants are required to submit an Environmental Intake Form (EIF) with their application to determine if an Environmental Impact Screening (EIS) is required. If an Environmental Impact Screening is required, an interagency review team will look over the applicants' Environmental Impact Screening Form (EISF) and make a determination**." (Emphasis supplied)

That process was not followed. As indicated, construction began on 21 December 2021, and demolition began long before that date. For the first time, on 4 February 2022, the D.C. Department of General Services submitted an Environmental Impact Screening Form (EISF), *Plaintiffs' Exhibit AA*. Indeed, two Paragraphs in the recently revealed EISF are shocking. They state:

[1] Ms. Shoenfeld is a Historian and serves as the Principal for Prologue D.C. Her complete Vita is annexed.

D. UNAVOIDABLE IMPACTS

The site has been confirmed to contain elevated levels of volatile organic compounds in select areas as outlined in the Environmental Site Assessment. Furthermore, seven (7) subgrade abandoned tanks are confirmed to be within the property area. Both soil remediation and tank removal [will] be required for this project.

E. MITIGATION STEPS

All disturbed soil which has been confirmed to be contaminated with petroleum shall be remediated and backfilled as required by DOEE. Any tanks found within the building footprint are to be removed or abandoned in-place in compliance [with] all regulatory codes. Positive drainage shall be provided throughout the site in conjunction with designated bio-retention areas as outlined on the site plan attachments.

This is irrefutable PROOF that Respondents did not follow the D.C. Environmental Policy Act when siting the Brentwood Bus Terminal! They are only now issuing an Environmental Impact Screening Form – the first step in the process. Moreover, the documents reveal the site is

HIGHLY CONTAMINATED.

Then, on 23 February 2022, the EISF Coordinator sent the following Memorandum to the Interagency Review Team: Attached is the EISF application for the subject project. Please complete an environmental assessment for your respective areas and return it to me by **March 4, 2022**. Please call me at 535-2506, should you have any questions.

1. Project: 1601 West Street, NE Bus Terminal
2. Location: 1601 West Street, NE

EISF #: 00-0958

The EISF application was verified on 15 February 2022, by Mr. Jalloh Mohamed, under criminal penalty if there were any false statements. The application contained a construction start date of April 2020, and an operational date of 31 August 2022.

Then on 25 February 2022, the D.C. Department of Energy and Environment sent the following to the affected Advisory Neighborhood Commissioners:

From: Zangrilli, Jacob (DOEE) <jacob.zangrilli@dc.gov>
Sent: Friday, February 25, 2022 11:09 AM
To: Brevard, Gail (SMD 5C01) <5C01@anc.dc.gov>; Rogers, Lauren (SMD 5C02) <5C02@anc.dc.gov>; Manning, Jacqueline (SMD 5C04) <5C04@anc.dc.gov>; Oliver, Darlene (SMD 5C05) <5C05@anc.dc.gov>; Thomas III, Harry (SMD 5C06) <5C06@anc.dc.gov>; Montague Jr., Jeremiah (SMD 5C07) <5C07@anc.dc.gov>
Cc: Criner-Brown, Allyson (DOEE) <allyson.criner-brown@dc.gov>; Bullo, Ibrahim (DOEE) <ibrahim.bullo@dc.gov>
Subject: ANC 5C Notification - EISF -1601 West St NE (OSSE Bus Terminal)

Good Morning ANC 5C [The Brentwood Location]. This week DOEE received an Environmental Impact Screening Form for the OSSE Bus Terminal Project at 1601 W Street NE. **The demographics of the project area, and the intended final use of the site, warrant increased community notification, participation, and feedback. To that end, I am providing you all with the EISF submission, existing site plans, proposed site plans, and EISF project summary.** (Emphasis supplied)

Please note that the EISF is currently under DOEE review. This e-mail is for awareness and to establish a line of communication with the community. Please let me know if you have any questions and I will try to answer them to the best of my ability or put you in contact with the appropriate person.
Respectfully,

Jacob Zangrilli
Environmental Protection Specialist
Office of Enforcement and Environmental Justice
Department of Energy & Environment
Government of the District of Columbia
1200 First St., NE 7th Floor
Washington, DC 20002
Desk: 202-535-2645
Cell: 202-497-4351

Notably, Mr. Zangrilli's statement, "The demographics of the project area, and the intended final use of the site, warrant increased community notification, participation, and feedback. To that end, I am providing you all with the EISF submission, existing site plans, proposed site plans, and EISF project summary," underscores the failings of Defendants in following the Advisory Neighborhood Commission Laws.[2]

[2] **Note** - Under the Rules of Evidence, a declaration against interest is defined as a statement made by a declarant who is unavailable that is against the declarant's pecuniary, proprietary, or penal interest when it was made. A statement against interest is admissible as an exception to the hearsay rule. Similarly, an Admission against Interest is an out-of-court statement by a party that, when uttered, is against the party's pecuniary, proprietary, or penal interest and that is admissible under both an exclusion and an exception to the rule against hearsay. Such a statement is admissible even if the declarant is available, because an admission by a party-opponent is non-hearsay and, thus, does not require unavailability, *On Lee v. U.S.*, 343 U.S. 747 (1952). In D.C., the party seeking to admit evidence under this exception must satisfy four conditions. First, the proponent must prove that the declarant is unavailable. The declarant might be refusing to testify, *Laumer v. United States*, 409 A.2d 190,199-200 (D.C. 1979)(en banc). Second, corroborating circumstances must clearly indicate the trustworthiness of the statement. The court might consider, for example, the time of the declaration and the party to whom it was made; the existing of corroborating evidence; and the extent to which the declaration is really against the declarant's interests. *See United States v. Edelen*, 996 F.2d 1238, 1242 (D.C. Cir. 1993). Third, the proponent must prove that the declarant knew when making the statement that it was against his or her interest. Finally, the proponent must demonstrate that the statement was against the declarant's proprietary, pecuniary, or penal interest, *Id.* at 196. Each prong of this Test is here met.

Courts have halted the construction of a Dam[3], whose construction was nearly completed, costing $150 million, to save the snail darter, a fish facing extinction; ruling that the construction of the Dam was a *prima facie* violation of the Environmental Species Act (ESA). That Federal Court of Appeals deferred to the plain language of the ESA, *Hiram Hill v. Tennessee Valley Authority*, 549 F.2d 1064, 1069 (CA6 1977); The United States Supreme Court affirmed the Court of Appeals Decision by a vote of 6 to 3, *Tennessee Valley Authority v. Hiram Hill et al.*, 437 U.S. 153 (1978)[4]. Similarly, a $44 million road project was halted in San Antonio, Texas to save endangered, eyeless spiders, known as the Braken Bat Cave Meshweaver.

Surely, this $20 million, proposed Bus Depot, the subject of the instant matter, can be halted in the Brentwood Community of Washington, D.C. to spare the health, safety and perhaps lives of these besieged citizens, especially, inasmuch as, like the Tennessee Valley Authority, the District of Columbia's Agencies, even though expressly asked, have ignored countless laws in its "Bull in the China Shop" path to push through this Project.

The Complainants have Standing

As the United States Supreme Court has observed, imminent harm encompasses "threatened" as well as "actual" injury, *Valley Forge Christian College v. Americans United for Separation of Church and State*, 454 U.S. 464, 472 (1982). And see *Gladstone Realtors v. City of Bellwood*, 441 U.S. 91, 99 (1979). Even a "small probability" of harm is sufficient to take a lawsuit out of the category of "hypothetical," *Elk Grove v. Evans*, 997 F.2d 328, 329 (7th Cir.

[3] The Tellico Dam Project was a 38,000 acre water resource and regional economic development project located on the Little Tennessee River.

[4] At the Federal District Court level, in advance of the appeal to the Federal Court of Appeals, local citizens and conservation groups brought suit in the District Court, claiming that the project did not conform to the requirements of the National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. § 4321 *et seq.* After finding TVA to be in violation of NEPA, the District Court too enjoined the Dam's completion pending the filing of an appropriate Environmental Impact Statement. *Environmental Defense Fund v. TVA*, 339 F. Supp. 806 (ED Tenn.), aff'd, 468 F.2d 1164 (CA6 1972). The Dam was built, only because Congress eventually passed a rider on an appropriations bill that exempted the Tellico Dam from the ESA. Construction was completed in 1979, but *TVA v. Hill* is nonetheless considered a conservation success in that it demonstrated the courts' willingness to enforce the ESA.

1993). Indeed, "relatively minor increments of risk" qualify for standing and meet the requirements of *Lujan*, *Mountain States Legal Foundation v. Glickman*, 92 F.3d 1228, 1231-1234 (D.C. Cir. 1996). In *Vermont Agency of Natural Resources v. United States ex rel. Stevens,* , 529 U.S. 765 (2000), the Court endorsed the "partial assignment" approach to standing to sue, allowing private individuals to sue on behalf of the U.S. government for injuries suffered solely by the government. The United States Supreme Court in *Massachusetts v. EPA*, 549 U.S. 497 (2007), found that Massachusetts and eleven other states had standing, due to its "stake in protecting its quasi-sovereign interests" as a state, to sue the EPA over potential damage caused to its territory by global warming. The Court rejected the EPA's argument that the Clean Air Act was not meant to refer to carbon emissions in the section giving the EPA authority to regulate "air pollution agent[s]".And, in an even later environmental Case, on November 2, 2018, the U.S. Supreme Court announced that the trial in a case brought by 21 people, including minors, against the federal government for its role in the global warming crisis, could continue, *Juliana v. United States,* 10 U.S. 327 (2018).

Standing is the legal right to initiate (participate in) a lawsuit. A party must be sufficiently affected by the matter at hand, and there must be a case or controversy that can be resolved by legal action. There are three requirements for standing: (1) injury in fact, which means an invasion of a legally protected interest that is (a) concrete and particularized, and (b) actual or imminent, not conjectural or hypothetical; (2) a causal relationship between the injury and the challenged conduct, which means that the injury fairly can be traced to the challenged action of the defendant, and has not resulted from the independent action of some third party not before the court; and (3) a likelihood that the injury will be redressed by a favorable decision, which means that the prospect of obtaining relief from the injury as a result of a favorable ruling

is not too speculative, *Lujan v. Defenders of Wildlife*, 112 S. Ct. 2130, 2136 (1992). In deciding whether a party has standing, a court must consider the allegations of fact contained in the complaint and affidavits in support of the party's assertion of standing. See *Warth v. Seldin*, 422 U.S. 490, 501 (1974). And, see *Warth*, 422 U.S. at 501 (when addressing motion to dismiss for lack of standing, both the D.C. Superior Court and the Court of Appeals must accept as true all material allegations of the complaint and must construe the complaint in favor of the party claiming standing. Standing is founded "in concern about the proper--and properly limited--role of the courts in a democratic society, "*Warth*, 422 U.S. at 498. In the instant matter, Complainants show 1) concrete personal injuries that are actual or imminent; 2) that are clearly traceable to Respondents' conduct; and 3) that are "likely" to be redressed if the relief sought is granted, *Lujan v. Defenders of Wildlife*, 504 U.S. 555 (1992). Complainants meet the Standing requirements. The evidence at this stage, clearly demonstrates that the actual or imminent threat of personal injuries test is met. These are probabilistic injuries. And, these injuries are traceable to the acts of

Respondents. Moreover, at this stage Complainants' burden is at a point where a Tribunal must, "… presume that general allegations embrace the specific facts … necessary to support the claim," *Lujan* at 561.[5] Given that the fate of the injury and damages that is the subject of this Complaint can only be fully protected by the Complainants, Standing cannot be questioned. *Riverside Hospital v. D.C. Department of Health*, 944 A.2d 1098 (2008) in fact found that

[5] As the United States Supreme Court has observed, imminent harm encompasses "threatened" as well as "actual" injury, *Valley Forge Christian College v. Americans United for Separation of Church and State*, 454 U.S. 464, 472 (1982). And see *Gladstone Realtors v. City of Bellwood*, 441 U.S. 91, 99 (1979). Even a "small probability" of harm is sufficient to take a lawsuit out of the category of "hypothetical," *Elk Grove v. Evans*, 997 F.2d 328, 329 (7th Cir. 1993). Indeed, "relatively minor increments of risk" qualify for standing and meet the requirements of *Lujan, Mountain States Legal Foundation v. Glickman*, 92 F.3d 1228, 1231-1234 (D.C. Cir. 1996). In *Vermont Agency of Natural Resources v. United States ex rel. Stevens*, 529 U.S. 765 (2000), the Court endorsed the "partial assignment" approach to standing to sue, allowing private individuals to sue on behalf of the U.S. government for injuries suffered solely by the government.

Plaintiff had standing to assert its rights.

Respondents' own words, declarations against interest, take Complainants' grievances out of the area of speculative, "The site has been confirmed to contain elevated levels of volatile organic compounds in select areas as outlined in the Environmental Site Assessment. Furthermore, seven (7) subgrade abandoned tanks are confirmed to be within the property area. Both soil remediation and tank removal be required for this project." And, those words of Respondents undergird and reinforce the words of multiple expert views, unrebutted and uncontested admonition from a range and growing number of lettered, health experts[6] about the cumulative and ongoing threat to the health, safety and life of residents in the Brentwood Neighborhood of Washington, D.C.[7] Respondents state in their EIF, "All disturbed soil which has been confirmed to be contaminated with petroleum shall be remediated and backfilled as required by DOEE. Any tanks found within the building footprint are to be removed or abandoned in-place in compliance [with] all regulatory codes. Positive drainage shall be provided throughout the site in conjunction with designated bio-retention areas as outlined on the site plan attachments." The concreteness of Complainants' claims are further underscored by the EJSCREEN of the Environmental Protection Agency and Respondents' own Health Equity Report. And, how much more concrete can one get than the sworn claims of Complainants, below?

The Complainants

Hundreds of Brentwood Residents, most of whom are Black, signed a Petition against the Bus Depot, indeed, "strongly objecting," and that Petition was presented to Respondents, who have ignored it and other protests by Brentwood Residents. Six of those Residents five of whom are Black below express and show the impact of the Bus Depot on their lives.

[6] Now numbering fourteen (14).

[7] See *Plaintiffs' Exhibit A*, previously submitted.

AFFIDAVIT OF ANC 5CO5 COMMISSIONER DARLENE OLIVER[8]

I, Darlene Oliver, of [redacted] in Washington DC 20018, do hereby state as follows:

1. In January 2019, I became an Advisory Neighborhood Commissioner for the first time and I am currently in my second term. I represent Single Member District (SMD) 5C05.

2. I first learned that a bus terminal was being discussed for the neighborhood that I represent in the spring of 2019. When I first heard of talk of a bus terminal in my neighborhood, I communicated with the Department of General Services (DGS) to get details.

3. The first meetings with residents about the 1601 W Street, NE bus terminal project in our neighborhood were in October 2019. I am unaware of any meeting earlier than October 2019. DGS communicated with me and ANC 5C. I held a SMD 5C05 single member district meeting on October 15 and an ANC 5C public meeting was held on October 16, 2019.

4. Government representatives made a presentation at my SMD meeting about the proposed bus terminal at 1601 W Street, NE. Approximately ten (10) residents attended my meeting. Government representatives from DGS and the Office of the State Superintendent for Education (OSSE) spoke at the meeting. The government representatives did not ask the views of the residents. So, I asked residents whether they were in favor of a bus terminal and most residents in attendance opposed the bus terminal site.

5. Then, on October 16, 2019, ANC 5C held its public meeting at which representatives from DGS and OSSE provided certain information about the proposed bus terminal. At this meeting, ANC 5C Chair Jacqueline Manning proposed rerouting the buses of the proposed terminal through the streets trash trucks travel so that buses would not travel through residential neighborhoods. The city officials at the meeting told us they would get back to us.

6. In an October 16, 2019 email, DGS representative Wayne Gore thanked the ANC for allowing the agencies to present information on the proposed bus terminal project. Mr. Gore attached a copy of the PowerPoint presentation given at the October ANC meeting, but he failed to address any of the questions raised at the meeting.

7. After the initial presentations in October 2019, I spoked with Commissioner Chair Manning who said that our ANC would wait for DGS and OSSE to inform the community regarding the issue of rerouting buses. I reasoned that the W Street, NE bus terminal plan had not yet come into focus and was not sufficiently concrete to prompt an ANC response because the agencies failed to answer basic questions.

[8] A series of email exchanges that buttress the claims of Commissioner Oliver are annexed and made a part of this Complaint.

8. On November 1, 2019, DGS's William Gore emailed [redacted] and DDOT's Jeong-Olson, stating that the A/E team conducted an environmental impact study for internal use. He also said that all applicants are required to complete an Environmental Intake Form (EIF) with their application to determine if an Environmental Impact Screening (EIS) is required. He further said that the interagency review team will look over the screening form to determine if an Environmental Impact Screening is necessary. This email signaled that basic studies had not been completed to approve the bus terminal site. November 1, 2019 DGS Gore Email to [redacted] and OSSE Kell Jeong-Olsen.

9. On January 29, 2020, ANC 5C resident [redacted] submitted the petition signed by 164 members of the Brentwood community, opposing the bus terminal at 1601 W Street, NE location to DGS, DDOT, OSSE, and DC Councilmembers and their staffs, and copied me on the submission. January 29, 2020 [redacted] Email "Proposed OSSE-DOT Bus Terminal, 1601 W Street NE—Petition.

10. On or about March 2020, I testified at a budget hearing before the Committee on Facilities and Procurement chaired by Councilmember Robert White. I expressed my neighborhood's opposition to funding the proposed 1601 W Street, NE project site. Councilmember White stated that he had no knowledge of the site or project.

11. In an August 21, 2020 email, Ward 5 Councilmember Chief of Staff Marisa Flowers reported on information her office received from the Office of the City Administrator that d the bus terminal project would be rebid in the fall and that the city intended to undertake a new traffic study following the lifting of the Covid-19 emergency when traffic patterns return to normal. August 21, 2020 Email from [redacted] to Ward 5 Councilmember Chief of Staff Marisa Flowers re: Conference Call Monday 8/3 @ 1p-1:30p OSSE Lot. This information further contributed to my view that the bus terminal for my neighborhood was still speculative.

12. Sometime after November 23, 2020, I learned that DGS William Gore had communicated with an ANC 5C resident and stated that bid for construction was in the final stages and construction will start in early 2021.

13. On February 2, 2021, I learned from a January 29 email from Ward 5 Councilmember Chief of Staff Flowers that the City Administrator's Office in coordination with DGS will hire a consultant to conduct an updated traffic study when the District is back to normal traffic. February 2, 2021 Email from Stefania Slabyj to Ward 5 CM Chief of Staff Flowers titled Phase 1 of Proposed OSSE Bus Terminal Development Project.

14. On May 20, 2021, in an email from concerned ANC 5C resident [redacted] to several 5C Commissioners and Ward 5 Councilmember staff, the resident complained that construction appeared to be occurring at the 1601 W Street, NE site. I was confused by this development because of the assurances that I had learned from the Ward 5 Councilmember's Chief of Staff, based on her communications, most recently with the City Administrator, that the bus terminal project was ***not*** moving forward.

15. On July 13, 2021, I along with other Commissioners received an email from the Ward 5 Councilmember's Chief of Staff, sharing DGS's July 7 response to questions posed during a June 2021 onsite meeting. In the email, DGS said that it would not be possible to reroute bus traffic. July 13, 2021 Email from Ward 5 CM Chief of Staff Flowers re: OSSE Lot Construction at W Street – Feedback from DGS from Onsite Community Meeting. This information was shared nearly 2 years after ANC 5C Chair Manning first suggested rerouting. The information was shared after I had obtained conflicting information that the bus terminal project would be rebid and a new traffic study conducted after the pandemic ended.

I declare under penalty of perjury that the foregoing affidavit of three (3) pages, including this page, is true and correct.

Executed on December 29, 2021

/s/DARLENE OLIVER
(Wet Signature available, upon request

AFFIDAVIT OF [redacted]

I, (b) (6) Privacy, (b) (7)(C) Enforcement Privacy hereby state as follows:

1. I have lived at my current address for one year. I live with my dog. I also temporarily live with a friend's high school age daughter who is staying with me while she finishes the school year before moving to join her family. I do much of my work at home.

2. My block is one block north of and parallel to W Street, NE. I live one and one-half blocks from the Federal IPC Transfer Station which is also known as the trash transfer station. I pass the trash transfer station when I walk or drive to and from Giant Foods Market on Brentwood Road, NE. I smell the stinking transfer station when I pass by. I also smell the trash transfer station at my front door and at the stop sign at the end of my block.

3. I used to walk my dog in the vicinity of the trash transfer station, a vehicle repair business that is across the street from the transfer station, and Fort Meyers Construction Co. at 1155 W Street, NE, next to the vehicle repair. But I stopped walking my dog in the area because every time I saw rats running in and out of the trash transfer station and Fort Meyers Construction onto the sidewalks and street.

4. I see trucks every day throughout my neighborhood on 14th Street, 13th Street, 13th Place, and in my alley. In the morning, Capitol Paving Company trucks come from the company's facility at 1525 W Street, NE. I hear rattling these trucks, starting around 6:45 in the morning. The trucks using 14th Street and 13th Place in the morning as I walk my dog are really noisy.

5. Capitol Paving trucks return to the company's facility in the afternoon around 3 pm to 4 pm. When the trucks come from Brentwood Road, NE, they come into the neighborhood via 13th Street, NE. The alley between the rear of my home and the rear of the houses on W Street, NE is the route these trucks regularly take returning to the facility. These trucks speed as they rumble down my alley, causing my garage door to shake and disturbing everyone in my building.

6. When I leave home between 6 am and 7:30 am, there are pickup trucks and earth mover trucks going east on W Street, NE toward Montana Avenue, NE. I also see the earth movers traveling toward Downing Street, NE, going to 13th Place and then Brentwood Road.

7. I sometimes see Department of Public Works Solid Waste Management trucks (DPW) idling on W Street, NE. I see and smell DC Department of Transportation maintenance division white trucks with attachments on W Street and going north on 13th Place, NE.

8. The employees who work at the various companies and DC government facilities along W Street, NE park on 14th Street and W Street. They dump all kinds of trash in the streets, including water and soda bottles, food boxes, and chicken bones. We residents sometimes clean up the trash.

9. I have asthma and allergies. In October 2021, I went on a pollution walk with the Department of Energy and Environment. My throat became constricted and the doctor I saw a couple months later said that my nitrous oxide levels were many times higher than the safe level. My doctor prescribed steroids and other medicines I continue to take to help with my asthma. I believe the pollution which I experience living in my neighborhood may be a contributing factor to the asthma problems I've been having while living on Adams Street, NE. I did not have serious asthma issues in recent years before moving to Adams Street. As a result, I am considering moving from this area to protect my health. (check my notes for accuracy.)

I declare under penalty of perjury that the foregoing affidavit of two (2) pages, including this page, is true and correct.

Executed on March 16, 2022

(b) (6) Privacy, (b) (7)(C) Enforcement Privacy

(Wet signature available, upon request)

AFFIDAVIT OF (b) (6) Privacy, (b) (7)(C) Enforcement Privacy

I (b) (6) Privacy, (b) (7)(C) Enforcement Privacy hereby state as follows:

1. I have lived at my home on (b) (6) Privacy, (b) (7)(C) Enforcement Privacy for over five (5) years. My house is three doors from the intersection of (b) (6) Privacy, (b) (7)(C) Enforcement Privacy

2. W Street, NE form Montana Avenue to 14th Street is a two-way street and from 14th Street to 13th Street is a one-way street and continues to Brentwood Avenue with blocks of

commercial and industrial businesses on one side of W Street and blocks of row homes on the other side of the street.

3. My home and the 1601 W Street, NE lot are located in ANC single member district (SMD) 5C06. The other industrial and commercial businesses are located in SMDs 5C06 and 5C05.

4. In 2019 and 2020, Kirsten Williams was my SMD 5C06 Commissioner and she was not very active. Beginning in 2021, the SMD Commissioner was Harry Thomas, III. After a few months, Thomas moved out of the SMD. After many months with no Commissioner, a new SMD 5C06 Commissioner was elected in a special election in October, 2021.

5. The many industrial uses just a few doors from my home include Capitol Paving of DC, DC Department of Transportation Street and Bridge Maintenance Division, Department of Public Works Solid Waste Collection Division, Federal IPC Trash Transfer Station, and Fort Meyer Construction Co.

6. The trucks from these operations cross Montana Avenue, NE at W Street, NE and run along W Street or cut through 14th and 15th Streets, NE which are perpendicular to W Street. Sometimes the trucks use the alley behind W Street as a short-cut.

7. The sites operate six (6) days a week. The trucks go through my neighborhood starting early in the morning until 6 pm or 7 pm at night. These operations create noise from trucks maneuvering and testing and going in and out of the neighborhood in the morning to returning through the neighborhood at night. The trucks also illegally idle and park on W Street, NE and 16th Street, NE.

8. I smell the offensive smells from Capitol Paving and even more offensive smells of garbage from the trash transfer station.

9. October 2019 is when I first heard that DC government was thinking about locating a bus terminal on W Street, NE, a few houses from my home. That month, I attended two community meetings about the bus terminal and they are the only two about which I'm aware in 2019.

10. The first meeting was held by SMD 5C05 Commissioner Darlene Oliver and the second meeting was an ANC 5C Commission meeting. Department of General Services (DGS) and the Office of the State Superintendent for Education (OSSE) representatives spoke at both meetings and gave the same presentation at both.

11. I attended Commissioner Oliver's meeting because she was concerned even though the proposed bus terminal location is not in her SMD. I along with other residents expressed our dissatisfaction to DGS and OSSE.

12. DGS and OSSE explained that a bus terminal at 1601 W Street, NE would operate 230 buses with approximately 500 employees who would be permitted to drive to work and

park in our neighborhood.

13. The day after the SMD 5C05 meeting, I attended the ANC 5C public meeting and heard the same presentation. Residents raised concerns about already heavy industrial traffic, traffic congestion, trucks parking on both sides of W Street, NE, problems with residents' air quality, and high cancer and asthma rates.

14. Commissioner Manning who chaired the Commission meeting suggested to government officials that the buses be rerouted through a feeder road through the industrial sites instead of traveling along W Street, NE. DGS and OSSE representatives said they would review the suggestion and our concerns and get back to us.

15. Residents at the October ANC meeting asked the government representatives whether the bus terminal was a "done deal." DGS representative Wayne Gore told us the project was still in the planning stage. Based on discussion at the October 2019 meetings, I believed the agencies had not yet decided to build a bus terminal at 1601 W Street, NE just a few houses down from my home.

16. On November 1, 2019, DGS Gore emailed me and a representative of Councilmember McDuffie's office to say that a traffic study was conducted for the project at 1601 W Street, NE. He also said that an environmental intake form had to be submitted for the project and a determination made whether to conduct Environmental Impact Screening of the project. November 1, 2019 Email from William Gore (DGS) to [redacted] and [redacted]

17. In late January 2020, I sent a petition signed by 164 residents, opposing a bus terminal at 1601 W Street, NE to DGS, OSSE, DC Department of Transportation (DDOT), DPW, Ward 5 Councilmember McDuffie, and all other Councilmembers. January 29, 2020 Email from [redacted] to Various DC Agencies re: Proposed OSSE-DOT Bus Terminal, 1601 W Street, NE—Petition. No officials responded.

18. In March 2020, I along with Commissioner Oliver and other residents, participated in a meeting with Councilmember McDuffie's office. We learned that OSSE had not shared the agency's plans with the Ward 5 Councilmember. The Councilmember had shared the community's concerns with various government agencies, but did not know the status of the bus proposal or how the agencies would address community concerns.

19. In May 2020, I again communicated with CM McDuffie's Chief of Staff. Ms. Flowers said she had received feedback from DGS and OSSE. DGS told the Chief of Staff that a new traffic study conducted during the pandemic would not be reliable and the agency would explore a new analysis once normal traffic patterns had resumed. May 7, 2020 Email from Ward 5 CM Chief of Staff Marisa Flowers to [redacted] on OSSE Feedback.

20. In August 2020, the Ward 5 Councilmember's Chief of Staff Flowers shared with me an email she received from the Office of the City Administrator. The City Administrator

told Flowers, after speaking with DGS, DDOT, and OSSE, that the bus terminal project would be rebid in November and the city would perform a new traffic study after a new vendor is selected following lifting of the Covid-19 state of emergency, and environmental studies, as required by law. The Chief of Staff said the developments would necessitate extending the lease at the New York Avenue bus terminal. August 21, 2020 Email from Marisa Flowers to [redacted] titled OSSE Lot Update from Chief Administrator's Office. This information was further evidence of the uncertainty surrounding the proposed bus terminal project.

21. On January 28, 2021, I wrote to CM McDuffie's Chief of Staff Flowers to confirm that the Office of the City Administrator said that there would be no forward movement of the proposed bus terminal until the additional traffic study was completed. On January 29, Flowers wrote to confirm that she had the same understanding and she included representatives from the City Administrator and the Deputy Mayor for Education in her email thread. Neither the City Administrator or Deputy Mayor for Education responded to state otherwise. January 29, 2021 Email from Ward 5 CM Chief of Staff Marisa Flowers to [redacted]

22. On January 29, 2021, Ward 5 CM Chief of Staff Flowers said that the City Administrator's office reported that the agency, in coordination with DGS, will hire a consultant to conduct an updated traffic study when the city is back to "normal traffic." January 29, 2021 Email from Ward 5 CM Chief of Staff Marisa Flowers to [redacted]

23. In May 2021, residents reported seeing clearing of the lot at 1601 W Street, NE.

24. On July 13, 2021, Ward 5 CM Chief of Staff Flowers sent me and others an email from DGS in which the agency said that OSSE would not reroute traffic to avoid increased traffic congestion, noise, and pollution that would result from operation of buses going in and at on W Street, NE. OSSE's refusal to reroute its buses away from W Street, NE was conveyed to us nearly two years after Chair Manning asked DGS and OSSE to consider rerouting and after nearly two years of conflicting information about the status of the proposed terminal. July 13, 2021 Email from Ward 5 CM Chief of Staff Marisa Flowers to ANC 5C Commissioners and Neighborhood Residents re: OSSE Lot Construction at W Street—Feedback from DGS from Onsite Community Meeting.

25. Based on my contacts and communications with DC agencies over the past two years, particularly DGS and OSSE, I believe the agencies intentionally gave residents misinformation, conflicting information, and failed to engage my community in a transparent and accountable way.

I declare under penalty of perjury that the foregoing affidavit of four (4) pages, including this page, is true and correct.

Executed on February 7, 2022

[redacted]

[redacted]

(Wet signature available upon request)

[redacted] has lived in Brentwood for more than 40 years. Both of her elderly parents live in the same household. Her Father is 75 years old and suffers from Prostate Cancer. Her younger Brother, who also lives in the household, suffers from Asthma. The Family relies upon street parking and now find it difficult to park at times, even without the proposed Bus Terminal.

[redacted] has lived in Brentwood since 1998. At 59 years old, she has heart problems, asthma is on seizure medication and had surgery in January 2017. She is unable to work due to those health conditions. Ironically, at one time, she was employed by OSSE and engaged in the discussions surrounding this proposed Bus Terminal.

[redacted] is the Father of four children, all of whom together with his spouse live in their home in Brentwood. The Family has resided there for 15 years. [redacted] has asthma and Reggie, Jr. was diagnosed with asthma after the Family moved to Brentwood. Their 15 year old Daughter [redacted] has eczema, and their 9 year old son [redacted] has constant headaches. The oldest Daughter, [redacted] is away from the home and seems to have been spared. The Family, like all others in Brentwood, has difficulty with traffic and parking.

The infirmities and other impacts experienced by the [redacted] Family are typical in Brentwood, some better, some worse. At a Hearing, there will be an unending parade of witnesses who will tell of the woes they have met while living in Brentwood.

Relevant Legal and Factual Background

Although many courts do not compel complainants to present comparator evidence,[9] an

[9] See *Brown v. Henderson*, 257 F.3d 246, 253 (2d Cir. 2001) ("Thus, though it is helpful in proving sex discrimination, we have held that it is not strictly necessary for a plaintiff to identify an employee who was treated more favorably than the plaintiff and who was similarly situated to the plaintiff, except for being of the opposite sex."); *Sarullo v. U.S. Post. Serv.*, 352 F.3d 789, 798 n.7 (3d Cir. 2003); *George v. Leavitt*, 407 F.3d 405, 412 (D.C. Cir. 2005); *Holifield v.*

important element of a *prima facie* case of disparate treatment is a showing that two similarly situated things were treated differently. The U.S. Supreme Court laid out the elements of a *prima facie* case of discrimination. In the instant Case, a prima facie case is shown by establishing that Plaintiffs 1) are members of a protected class;[10] 2) suffer regular adverse, disparate treatment at the hands of Defendants; and 3) similarly situated residents, outside of the protected class, receive more favorable treatment, *McDonnell Douglas Corp. v. Green*, 411 U.S. 792, 802 (1973). All of the elements of the *McDonnell Douglas* test are met. "[T]he burden of establishing a *prima facie* case of disparate treatment is not onerous," *Texas Dept. of Community Affairs v. Burdine*, 450 U.S. 248, 253 (1981). A plaintiff can establish a *prima facie* case by "offering evidence adequate to create an inference that decisions by those authorized to make them were based on a [illegal] discriminatory criteria, " *Mitchell v. Office of the Los Angeles County Superintendent of Schools*, 805 F.2d 844, 846 (9th Cir. 1986) (quoting *Teamsters v. United States*, 431 U.S. 324, 358 (1977)); and see *Lowe v. City of Monrovia*, 775 F.2d 998, 1006 (9th Cir. 1985) (plaintiff can establish a *prima facie* case of disparate treatment without satisfying the *McDonnell Douglas* test if plaintiff provides evidence suggesting decision was based on discriminatory criteria), *United States v. Loud Hawk*, 784 F.2d 1407 (1986). A complainant who provides such evidence for his or her *prima facie* case may be able to survive summary judgment on this evidence alone, *Lowe*, 775 F.2d 998, at 1008. "The purpose of America's laws is the removal of artificial, arbitrary, and unnecessary barriers to [equal treatment] when the barriers operate invidiously to discriminate on the basis of … impermissible

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Reno, 115 F.3d 1555, 1562 (11th Cir. 1997); and *Rodgers v. U.S. Bank, N.A.*, 417 F.3d 845, 859 n.9 (8th Cir. 2005) ("Of course, a discharged employee need not rely on comparisons with similarly situated employees to prove unlawful discrimination.) "Nothing in the case law in this circuit requires a plaintiff to compare [himself] to similarly situated co-workers to satisfy the fourth element of [his] prima facie case," *EEOC v. Horizon/CMS Healthcare Corp.*, 220 F.3d 1184, 1195 n.6 (10th Cir. 2000).

classification," 411 U.S. 792, 800-801 (1973). In sum, *McDonnell Douglas* enunciates that the primary purpose of laws banning discrimination is to assure neutral treatment practices and decisions. In this Case, the Brentwood Community has been treated differently than all other District of Columbia communities when it comes to the location of toxic facilities.

As indicated, more than half of the Industrial Facilities in the District of Columbia plague Ward Five where the Brentwood Community is located. The cumulative effects of this disproportionate placement of Industrial Facilities are long term and compounded. Now, the Respondents want to put a Bus Depot in the heart of this residential neighborhood, with 250 buses, 500 employees who drive to work and occupy the limited neighborhood parking spaces, a fueling station and a training facility for bus drivers. The Facility would be placed at the vortex of Montana Avenue and "W" Street, one block from New York Avenue and the Amtrak Yard where trains assemble. In addition, nearby are diesel spewing snow plows, salt trucks, limousine buses and other trucks and buses on at least 10 acres of land owned by the District Government and within breathing distance of its Brentwood residents. Worse, already in the Neighborhood is the Brentwood Solid Waste Disposal Facility, located at 1241 "W" Street, N.E.; the DPW Solid Waste Collection Division, the DDOT Street and Bridge Maintenance Division, located at 1531 "W" Street, N.E.; next to the Capitol Paving of D.C. Construction Company, located at 1525 "W" Street, N.E.; the Federal IPC Transfer (the recycling center), located at 1220 "W" Street, N.E.; and the Fort Meyer Construction Company, located at 1155 "W" Street, N.E. Graphic Photos, annexed to this Complaint, show the gravity of theses toxic facilities, already there.

Without the proposed Bus Depot, those who live in Brentwood, due to existing, suffocating industrial pollution, are more likely to be afflicted with severe asthma, respiratory illness, cancer, lung disease, heart ailments, premature deaths and premature births, as well as

other related health challenges, than in any other place in Washington, D.C. Aggregate those health challenges by the invasion of the COVID Pandemic and the situation is horrifying!

No Real Concern about the Impact on Traffic that would result from the Bus Terminal

As early as 26 February 2020, Brentwood Residents sought the purported Traffic Study that had been undertaken by Defendants to justify locating the proposed Bus Terminal amongst their homes. That request was preceded by a Petition, signed by close to 200 Brentwood Residents, signed and presented on 29 January 2020 to, among others, several of Defendants' agencies (including DGS, OSSE and DDOT). The Petition, largely ignored by Respondents, "strongly objected" to the proposed Bus Depot.

Respondents undertook a one-day traffic study, about which the Consultant hired to do so at a community meeting on 28 June 2020, stated publicly that he "wouldn't 'stake his license' on the assessment." In addition to the 250 buses that will be traversing this Neighborhood beginning at 4:00 a.m. in the morning; as indicated, there will be 500 additional employees who, due to limited public transportation, will further congest traffic, and worse, take up the very limited neighborhood parking especially on "W" Street, across from the proposed Facility. Shockingly, the traffic study concedes that among the 250 buses to be operational, one will leave every 40 seconds during morning hours and one will return every 30 seconds during evening hours.

Analysis by Experts

Fourteen unbiased experts who did preliminary analysis of the i9mpact of the proposed Bus Depot stated in a recent Letter to Mayor Bowser[11], **"The bus terminal will add these traffic-related risks to a community whose existing health inequities have been outlined in the 2018 Health Equity Report.** Out of the 51 proximal neighborhood groups, Brentwood

[11] A complete copy of that Letter is annexed.

ranked high in deaths due to illnesses and health outcomes for which air pollution contributes to higher risk.

- 11th in deaths due to heart disease
- 13th in deaths due to chronic lower respiratory disease
- 15th in deaths due to strokes
- 16th for lowest life expectancy at birth
- 17th in deaths due to diabetes

The most recent District of Columbia Health Equity Report referred to by the Experts and led by Dr. LaQuandra Nesbitt who currently serves as the Director of the District of Columbia's Department of Health, in and of itself is riveting, revealing, alarming and most disturbing. Drawing from that Report and other sources, that elite group of scientists and environmental educators have issued a word of caution to Defendants on the adverse conditions that would result from still another toxic and congestion causing facility in Brentwood. Their conclusions include:

- Health impacts of school bus pollution
- Cumulative health impacts of multiple concentrated pollution sources
- Traffic studies, congestion, parking and other deleterious and destructive harms
- The further degradation of air quality
- Prevalence of asthma and other respiratory illness in the affected community
- Prevalence of cancer, low birthweight/infant mortality, and other health impacts in the affected community
- Land use and zoning, particularly with siting industrial facilities in an urban setting
- Other environmental considerations such as water, soil, etc.

And, the most recent EJScreen Assessment, conducted by the U.S. Environmental Protection Agency found the following:

Additional Review Required

Site Name: Proposed OSSE school bus terminal at 1601 W Street NE
Site Address: 1601 W St NE, Washington, DC 20018
Lat/Long: 38.918919, -76.980300
Horizontal Collection Method: Address Matching-House Number
Reference Point: 1601 W St NE, Washington, DC 20018

EJSCREEN Results:

EJSCREEN provides information on eleven different EJ Indexes. Each EJ Index combines one environmental measure with demographic data to characterize potential areas of EJ concern that may warrant further consideration, analysis, or outreach.

According to the EJSCREEN Common User Guidelines, a site will be considered a good candidate for additional review when an EJSCREEN analysis for that area shows one or more of the eleven Primary EJ Indexes is at or above the 80th percentile in the **nation**. Region III's protocol when conducting an additional screening review is that if the site is **also** located in an area where one or more of the eleven Primary EJ Indexes is at or above the 80th percentile for the **state**, that site is considered to be in an area of potential EJ concern. An area may also warrant additional review if other readily available information suggests the potential for EJ concerns. For this assessment information was considered on the block group which contains the site as well as using a one-mile radius around the site due to sparse population.

When considering the block group which contains **1601 W St NE, Washington, DC 20018** and the area within a one-mile radius around the facility, ALL of the primary EJ Indexes are at-or-above the 80th percentile in the nation and several are above the 80th percentile in the state. For the one-mile radius area around the facility, the Percentage of people of Color Population is 84% (vs 64% in the state) and Low-income Population is at 39% (vs 29% state). The EJSCREEN assessment indicates this is an area of EJ concern.

It is vital to ensure the community is informed and provided an opportunity to voice concerns and participate in decisions about activities that may affect their environment and/or health. This assessment should be used in conjunction with your knowledge and understanding of the site as well as your understanding of the specific situation.

The EJSCREEN report is attached and contains all state, national and regional percentiles for EJ indicators and demographic data.

EJSCREEN is a screening tool for pre-decisional use only. It can help identify areas that may warrant additional consideration, analysis, or outreach. It does not provide a basis for decision-making, but it may help identify potential areas of EJ concern. Users should keep in mind that screening tools are subject to substantial uncertainty in their demographic and environmental data, particularly when looking at small geographic areas. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports. This screening tool does not provide data on every environmental impact and demographic factor that may be relevant to a particular location. EJSCREEN outputs should be supplemented with additional information and local knowledge before taking any action to address potential EJ concerns.

This version of EJSCREEN (https://www.epa.gov/ejscreen) is available to the public and the attachment may be shared. Do not release Region III's protocols associated with EJSCREEN.

<u>For Inclusion in Case Conclusion Data Sheets/ICIS:</u>

EJSCREEN Flag National: __X__ Yes _____ No
EJSCREEN Flag State: ___X___ Yes _____ No

Enhanced Review for Potential EJ Concerns:

___X___ Enhanced Review – Potential EJ Concern Found
_____ Enhanced Review – Potential EJ Concern Not Found
_____ No Enhanced Review

Basis of EJ Determination (Select all that apply):

_____ Community Self-Identification
___X_ EJSCREEN data
_____ EPA knowledge of community/location (including inspector observation)
_____ Other basis (Please Explain)
_____Other Federal Government knowledge of community/location
_____Public Input
_____State/Local/Tribal Government knowledge of community/location

Explanation of Basis:

When considering the block group which contains **1601 W St NE, Washington, DC 20018** and the area within a one-mile radius around the facility, ALL of the primary EJ Indexes are at-or-above the 80th percentile in the nation and several are above the 80th percentile in the state. For the one-mile radius area around the facility, the Percentage of people of Color Population is 84% (vs 64% in the state) and Low-income Population is at 39% (vs 29% state).

Further Relevant Legal and Factual Background

The Community of Brentwood is adjacent to the Community of Ivy City. Because of previous actions by Respondents, 1) Ivy City, also predominantly Black, is already surrounded by hundreds of diesel-fueled school buses on both sides of Kendall Street, just a short walk from residences; 2) it is currently surrounded by hundreds of diesel-spewing snow and salt trucks; 3) at least a hundred diesel-spewing limousine buses are at the edge of Ivy City; 4) various other diesel-spewing buses and two and a quarter ton trucks park on several streets of Ivy City, without control or regulation by the District Government; and 5) hundreds of automobiles park in and near and along every street in Ivy City several nights a week to patronize the City Winery Nightclub, just a short walk from homes in that Community. Vehicles, numbering in the hundreds, typically idle in Ivy City, especially in cold conditions, including the very harmful

diesel-spewing trucks, buses or equipment.

Respondents, who are pushing the ill-conceived "W" Street Bus Terminal in Brentwood, seem to share the Trump view --- laws don't apply to them. This proposal has moved forward, contrary to law, without an Environmental Impact Statement; without formal notice to the citizens; without giving residents meaningful input; without transparency; without regard to the Comprehensive Plan; without required attention to Zoning issues; apparently without competitive bidding or concern for the First Source Law; and, of course, without regard to the historic inequities of such projects in Ward Five in general and Brentwood in particular.

Requests made to Respondents for appropriate environmental assessments have been ignored and have fallen on deaf ears.

The Disparate Impact, Disparate Treatment, Discrimination

Both disparate impact and disparate treatment are discriminatory practices. Disparate impact is often referred to as unintentional discrimination, whereas disparate treatment is intentional. Disparate impact occurs when policies, practices, rules or other systems that appear to be neutral result in a disproportionate impact on a protected group.

Burdens of proof for a claim of disparate treatment under Title VI of the Civil Rights Act of 1964, 42 U.S.C. §2000 (e) et. seq. (1982) was established in the U.S. Supreme Court, and that D.C. Courts generally follow the Title VI analysis in discrimination cases. Respondents have treated Complainants and all of Brentwood differently, disparately and discriminatorily than the remainder of Washington, D.C.

As indicated, although many courts do not compel plaintiffs to present comparator evidence,[12] an important element of a *prima facie* case of disparate treatment is a showing that

[12] See *Brown v. Henderson*, 257 F.3d 246, 253 (2d Cir. 2001) ("Thus, though it is helpful in proving sex discrimination, we have held that it is not strictly necessary for a plaintiff to identify an employee who was treated

two similarly situated individuals or classes were treated differently. The U.S. Supreme Court laid out the elements of a *prima facie* case of discrimination. In the instant matter a *prima facie* case can be shown by establishing that 1) Plaintiffs are members of a protected class;[13] 2) Plaintiffs suffered adverse, disparate, wrongful action at the hands of Defendants; and 3) similarly situated individuals or classes, outside of the protected class, receive more favorable treatment, *McDonnell Douglas Corp. v. Green*, 411 U.S. 792, 802 (1973). All of the elements of the *McDonnell Douglas* test are met. "[T]he burden of establishing a *prima facie* case of disparate treatment is not onerous," *Texas Dept. of Community Affairs v. Burdine*, 450 U.S. 248, 253 (1981). A plaintiff can establish a *prima facie* case by "offering evidence adequate to create an inference that decisions by those authorized to make them were based on a [illegal] discriminatory criteria, " *Mitchell v. Office of the Los Angeles County Superintendent of Schools*, 805 F.2d 844, 846 (9th Cir. 1986) (quoting *Teamsters v. United States*, 431 U.S. 324, 358 (1977)); and see *Lowe v. City of Monrovia*, 775 F.2d 998, 1006 (9th Cir. 1985) (plaintiff can establish a *prima facie* case of disparate treatment without satisfying the *McDonnell Douglas* test if he or she or they provides evidence suggesting rejection was based on discriminatory criteria), amended, 784 F.2d 1407 (1986). The D.C. Human Rights Commission citing *Rohde v. K.O. Steel Castings, Inc.*, 649 F.2d 317 (5th Cir.1981), which held that an employee proves a prima facie case when she shows that "two employees were involved in or accused of the same offense and are disciplined in different ways." This question was precisely the inquiry made by the Court

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more favorably than the plaintiff and who was similarly situated to the plaintiff, except for being of the opposite sex."); *Sarullo v. U.S. Post. Serv.*, 352 F.3d 789, 798 n.7 (3d Cir. 2003); *George v. Leavitt*, 407 F.3d 405, 412 (D.C. Cir. 2005); *Holifield v. Reno*, 115 F.3d 1555, 1562 (11th Cir. 1997); and *Rodgers v. U.S. Bank, N.A.*, 417 F.3d 845, 859 n.9 (8th Cir. 2005) ("Of course, a discharged employee need not rely on comparisons with similarly situated employees to prove unlawful discrimination.) "Nothing in the case law in this circuit requires a plaintiff to compare [himself] to similarly situated co-workers to satisfy the fourth element of [his] prima facie case," *EEOC v. Horizon/CMS Healthcare Corp.*, 220 F.3d 1184, 1195 n.6 (10th Cir. 2000).

in a recent matter, *Coleman v. Donahoe*, 667 F.3d 835 (2012). In *Coleman*, the Court stated, "... we reiterate here that the similarly-situated inquiry is flexible, common-sense, and factual. It asks 'essentially, are there enough common features between the individuals to allow a meaningful comparison?' *Humphries v. CBOCS West, Inc.*, 474 F.3d 387, 405 (7th Cir.2007), aff'd, 553 U.S. 442 (2008).

A Muddied Trail of Laws Broken by Respondents

The D.C. Human Rights Act Protects Residency, Where One Lives, and Race, Who One Is

The D.C. Human Rights Act was enacted by the D.C. Council with the intention "...to secure an end in the District of Columbia to discrimination for any reason other than that of individual merit ..." It is a broad remedial statute, to be generously construed, *Wallace v. Skadden, Arps, Slate, Meagher & Flom*, 715 A.2d 873, 889 (D.C. 1998); *Simpson v. District of Columbia Office of Human Rights*, 597 A.2d 392, 398 (D.C. 1991). The Courts have also described the Human Rights Act as a "powerful, flexible, and far-reaching prohibition against discrimination of many kinds," *Executive Sandwich Shoppe, Inc. v. Carr Realty Corp.*, 749 A.2d 724, 732 (D.C. 2000). The Act applies to the District Government, D.C. Code § 2–1402.73, and does not allow discrimination based upon residence.

In *Rap, Inc. v. D.C. Com'n on Human Rights* 485 A.2d 173 (1984), the D.C. Court of Appeals noted that the order and burdens of proof for a claim of disparate treatment under Title VI of the Civil Rights Act of 1964, 42 U.S.C. §2000 (e) et. seq. (1982) was established in the U.S. Supreme Court, and that D.C. Courts generally follow the Title VI analysis in discrimination cases brought under the D.C. Human Rights Act. Citing *Greater Washington Business Center v. District of Columbia Commission on Human Rights*, 454 A.2d 1333, 1338 (D.C.1982); and *Newsweek Magazine v. District of Columbia Commission on Human Rights*,

376 A.2d 777, 789 (D.C.1977). Respondents have treated Plaintiffs and all of Brentwood differently, disparately and discriminatorily than the remainder of Washington, D.C.

The District of Columbia Environmental Policy Act

The District of Columbia Environmental Policy Act of 1989, D.C. Code § 8-109 et seq. (2001 Edition, as amended) is very clear. The Act has as its purpose:

"To require the Mayor or any District of Columbia board, commission, authority, or person to prepare an environmental impact statement if the Mayor, board, commission, authority, or person proposes or approves an action that, if implemented, is likely to have a significant effect on the quality of the environment; to ensure the residents of the District of Columbia safe, healthful, productive, and aesthetically pleasing surroundings; and to develop a policy to ensure that economic, technical, and population growth occurs in an environmentally sound manner."

D.C. Code § 8-109.03(a) requires the preparation of an Environmental Impact Study ("EIS") for any "major action that is likely to have substantial negative impact on the environment;" and D.C. Code § 8-109.01(1) defines major action as "any action that costs over $1,000,000 and that may have a significant impact on the environment."

"Absent a clearly expressed intention to the contrary, language must ordinarily be regarded as conclusive." See generally *United States v. Kirby*, 74 U.S. 482 (1868); *Rector Holy Trinity Church v. United States* 143 U.S. 457 (1892); *Chung Fook v. White*, 264 U.S. 443 (1924); *United States v. X-Citement Video*, 513 U.S. 64 (1994).

The relevant regulations illuminate the statutory language: DCMR Title 20, Chapter 7200.1; 20 DCMR Title 20, Chapter 7201.2 (Major Actions for Which Environmental Impact Screening Forms are required; 20 DCMR 7201.2(i); 20 DCMR Sec. 903; and 20 DCMR Sec. 1506. The cost of most of the current construction ($20 million) is obviously over $1,000,000 (which must be adjusted to current dollars. Any objectionable construction within the neighborhood, such as the subject, proposed construction, should be viewed through the lens of the Environmental Policy Act.

An Environmental Impact Statement is required for this Project

The D.C. Environmental Protection Act requires the preparation of an Environmental Impact Statement (:EIS") for any "major action that is likely to have substantial negative impact on the environment," D.C. Code § 8-109.03(a). The statute defines an "action" as "a project or activity that involves the issuance of a lease, permit, license, certificate, other entitlement, or permission to act by an agency of the District government, *Id.* § 8-109.02(1). In addition, a "major action" is defined to be "any action that costs over $1,000,000 and that may have a significant impact on the environment[,]" D.C. Code § 8-109.02(2)." Agents of Defendants have indicated in writing that these provisions of law have not been complied with by Defendants.

The Advisory Neighborhood Commission Act - Never Satisfied by Respondents

Despite never having been provided with Notice or an opportunity to state its views, on 17 November 2021, the ANC5C Commissioners[14] unanimously passed a motion to oppose the OSSE bus terminal. When there are plans for construction, citizens have the right to notice and participation before such construction can begin. Notice to ANCs of certain actions or proposed action by the District Government is governed by sections 13(b) and (c) of the Advisory Neighborhood Commissions Act of 1975, effective October 10, 1975, D.C. Law 1-21, as amended by the Comprehensive Advisory Neighborhood Commissions Reform Amendment Act of 2000, effective June 27, 2000, D.C. Law 13-135, D.C. Official Code §1-309.10 (b) and (c) (2004 Supp.) (Collectively referred to as the ANC Act). Subsection (b) states:

"Thirty days written notice, excluding Saturdays, Sundays and legal holidays of such District government actions or proposed actions shall be given by first-class mail to the Office of Advisory Neighborhood Commissions, each affected Commission, the Commissioner representing a single member district affected by said actions, and to each affected Ward Councilmember, except where shorter notice on good cause made and published with the notice may be provided or in the case of an emergency and such notice shall be published in the District of Columbia Register. In cases in which the 30-day written notice requirement is not satisfied,

[14] The ANC affected by the proposed "W" Street Bus Terminal.

notification of such proposed government action or actions to the Commissioner representing the affected single member district shall be made by mail. The Register shall be made available, without cost, to each Commission. A central record of all such notices shall be held by the Office of Advisory Neighborhood Commissions," D.C. Code § 1-309.10 (a) and (b) (2004 Supp.)

Notice of actions regarding planning, streets, recreation, social services programs, education, health, safety, budget, and sanitation, must be given to each affected Commission area, D.C. Code § 1-309.10(c)(1) (2004 Supp.). Notice must also be given to each affected Commission "before the award of any grant funds to a citizen organization or group, or before the formulation of any final policy decision or guideline with respect to grant applications, comprehensive plans, requested or proposed zoning changes, variances, public improvements, licenses, or permits affecting said Commission area, the District budget and city goals and priorities, proposed changes in District government service delivery, and the opening of any proposed facility systems," D.C. Code Section 1-309.10(d)(3)(A) (2001 Edition, as amended).

The issues and concerns raised by ANC officials shall be given great weight during the deliberations by the governmental agency and those issues shall be discussed in the written rationale for the governmental decision taken. Citizens are not without recourse as the landscape of Washington, D.C. rapidly changes.

The Advisory Neighborhood Commission Act was never satisfied by Respondents

Notwithstanding clear, unequivocal statutory mandates Defendants elected to ignore the law regarding notice to the affected ANCs; and because notice is typically not provided the affected ANCs often have no opportunity to have their views timely considered.

The Brentwood Bus Terminal is not about liquor licenses, alley closings or neon signs in restaurants. This situation is about life, air quality, traffic congestion, noise pollution; the health, safety and lives of District citizens. That is why the affected Advisory Neighborhood

Commission passed a Resolution opposing the Bus Terminal (*Plaintiffs' Exhibit B*), despite never having been informed of or consulted about the proposal by Defendants..

Notice to ANCs of certain actions or proposed action by the District Government is governed by sections 13(b) and (c) of the *Advisory Commissions Act of 1975*, effective October 10, 1975, D.C. Law 1-21, as amended by the *Comprehensive Advisory Neighborhood Commissions Reform Amendment Act of 2000*, effective June 27, 2000, D.C. Law 13-135, D.C. Official Code §1-309.10 (b) and (c) (2004 Supp.) (collectively the ANC Act).

The D.C. Court of Appeals has interpreted the ANC notice provisions to require written notice of every proposed government decision affecting neighborhood planning and development for which a prior hearing is required by law, *Kopff v. District of Columbia ABC Board*, 381 A.2d 1372, 1381 (D.C. 1977). Notice to the public is a requirement of due process in order to give each citizen an "adequate opportunity to prepare and present its position." *Kopff*, 1382-83. Accordingly, it is clear that every due process requirement of law, every mandate that citizens be provided notice and the opportunity to participate, whether under the Advisory Neighborhood Commission Law or the Sunshine Amendment, the District Government in this instance have ignored and failed or refused to comply with the mandates of the law. These mandates and requirements are not optional. They must be followed. There is no ambiguity in the language of these mandates.

"[G]reat weight" implies explicit reference to each ANC issue and concern as such, as well as specific findings and conclusions with respect to each, *Kopff v. District of Columbia Alcoholic Beverage Control Board*, 381 A.2d 1372, 1384 (D.C. 1977). However, section 1-261(d) "does not require special deference to the views of an ANC but, rather, that an agency address its concerns with particularity," *Committee for Washington's Riverfront Parks v.*

Thompson, 451 A.2d 1177, 1194 (D.C. 1982). The notice required and the involvement of the ANC required by law, as conceded by Defendant Union Station Redevelopment Corporation in its Memorandum in Opposition, at Page 6, " ... [must] allow[s] meaningful participation in a proceeding ..." *Comm. for Wash.'s Riverfront Parks v. Thompson*, 451 A.2d 1177, 1183 (D.C. 1982). The District of Columbia never, at any point, provided actual or any notice to all the members of ANC 5-B, and have never tried. That is certainly a rhyme and a riddle. How could the ANC provide any weight when it was never given notice of any decision? When neither notice nor great weight has been given, strict statutory prerequisites under the plain language of the relevant statutes are violated. Any ongoing or planned construction may be without a legal foundation.

The District of Columbia Zoning Commission

The authority for the District of Columbia Environmental Policy Act of 1989 ("D.C. EPA") was given by D.C. Code § 8-109 et seq. and was enacted for the purpose of promoting [T]he health, safety and welfare of District of Columbia residents, to afford the fullest possible preservation and protection of the environment through a requirement that the environmental impact of proposed District government and privately initiated actions be examined before implementation and to require the Mayor, board, commission, or authority to substitute or require an applicant to substitute an alternative action or mitigating measures for a proposed action, if the alternative action or mitigating measures will accomplish the same purposes as the proposed action with minimized or no adverse environmental effects, District of Columbia Environmental Policy Act of 1989.

The ZRR failed to consider the environmental impact and the mandates of the D.C. EPA before implementing these zoning changes. The Commission failed to obtain any report or letter,

or even, to the public's knowledge, consult with the Department of Energy & Environment, in this complete overhaul and rewrite of Title 11. There was no Environmental Impact Statement requested or completed. The Commission violated the D.C. EPA when it failed to comply with the Washington D.C.'s environmental laws. It also is inconsistent with the Comprehensive Plan and its environmental concerns and promises the government made to the people of the city.

The Comprehensive Plan

The Comprehensive Plan makes clear why the D.C. EPA and coordination among agencies and caring for the environment is so important to Washington D.C. "The concept of sustainability runs through much of the Comprehensive Plan, from the renewal of brownfield sites to a renewed commitment to environmental justice in all neighborhoods of the city," Comprehensive Plan 207, "The earth, water, air, and biotic resources of the District must be protected," Comprehensive Plan 221. The Comprehensive Plan also discusses the D.C. EPA and how it came about. The District of Columbia Environmental Policy Act (D.C. EPA), modeled after the National Environmental Policy Act (NEPA), requires all District agencies to analyze and disclose the environmental effects of their major actions, including the permitting of new development. Environmental Impact Statements are required for projects that are likely to have substantial negative impacts on the environment, according to Comprehensive Plan 616.

Indeed, recognizing the special environmental needs of Brentwood and surrounding areas, the Langdon Overlay Map was created and had as its purposes, in part, to:

(a)Implement the Comprehensive Plan by protecting residences and residents from the adverse environmental, safety, and aesthetic impacts of abutting industrially zoned properties and uses, District of Columbia Zoning Regulations, Section11-806.2. The constraints on uses and the prohibitions from the Langdon Overlay are still found at Section 11-602 of the District of

Columbia Zoning Regulations[15],

prompting one high placed District of Columbia Official to speculate that the Langdon Overlay language may be a bar to the construction of the proposed "W" Street Bus Terminal.

The *Durant* Case

Change began in the District of Columbia with The *Durant* Case, *Durant v. District of Columbia Zoning Commission*, 139 A.3d 880 (D.C. 2016). In *Durant*, the D.C. Court of Appeals stated, "We normally defer to [an] agency's decision so long as it flows rationally from the facts and is supported by substantial evidence." *Levy v. District of Columbia Rental Hous. Comm'n,* 126 A.ed 684, 688 (D.C.2015). Specifically, "[b]ecause of the Commission's statutory role and subject-matter expertise, we generally defer to the Commission's interpretation of the zoning regulations and their relationship to the Comprehensive Plan," *Howell v. District of Columbia Zoning Comm'n,* 97 A.3d 579, 581 (D.C.2014). "We do not defer, however", the Court stated "to an agency interpretation that is unreasonable or contrary to the language of the applicable provisions, e.g., *Citizens Ass'n v. District of Columbia Bd. of Zoning Adjustment,* 642 A.2d 125,128 (D.C.1994)." In the end, the D.C. Court of Appeals concluded, "For the foregoing reasons, we conclude that the Commission has failed to justify a conclusion that the proposed PUD would be a moderate-density use." The Application was denied.

Competitive Bidding

While the prohibition on the renewal or extension of sole source contract awards in the District of Columbia has been repealed, sole source contracts remain discouraged in the District

[15] SOURCE: § 4502.4 of the Zoning Regulations, effective May 12, 1958; as amended by Final Rulemaking published at 22 DCR 1901 (October 14, 1975); Final Rulemaking published at 24 DCR 5144, 5147 (December 16, 1977); and Final Rulemaking published at 47 DCR 9741-43 (December 8, 2000), incorporating by reference the text of Proposed Rulemaking published at 47 DCR 8335, 8380 (October 20, 2000) ; as amended by Final Rulemaking published 54 DCR 8943 (September 14, 2007); as amended by Final Rulemaking published 54 DCR 8976 (September 14, 2007); as amended by Final Rulemaking and Order No. 09-16 published at 57 DCR 2961 (April 2, 2010); as amended by Notice of Final Rulemaking published at 59 DCR 4236, 4237 (May 4, 2012).

of Columbia. The primary difference between a single source vendor contract and a sole source contract is choice. When you deal with a single source vendor, you're able to compare different vendors based on factors such as price and quality. After evaluating those options, you choose the single source vendor that best matches your wants and needs. In contrast, a sole source vendor doesn't give you any options because that vendor is the only vendor that can provide you with the products and goods you need. In other words, that vendor is the sole source of the product you need, so you have to make a deal with that vendor, even if costs more than you want to pay.

Open Meetings and Transparency – Government in the Sunshine

D.C. Code § 1-207.42 requires that only meetings "at which official action of any kind is taken" need be open to the public. Following that command, public officials meet secretly to deliberate and formulate their positions and invite the public in only to witness the formal voting, after the deed is done. That is what happened in the instant situation.

In passing the D.C. Home Rule Act, Congress made it clear that public observation of the governmental decision-making process has a salutary effect.[16] The Sunshine Amendment was offered on the House Floor and accepted without substantive debate.[17] In executing and issuing the Executive Order, Mayor's Order 2012-14, issued on 25 January 2012, failed and more recently continue to comply with the provisions of the Sunshine Amendment in the Self Government Act which states, "(a) all meetings (including hearings) of any department, agency, board or commission of the District government, including meetings of the District Council, at which official action of any kind is taken shall be open to the public. *No resolution, rule, act,*

[16] A Law Review Article in support of open meeting laws and frequently read at the time the Self Government Act passed is *Open Meeting Statutes: The Press Fights for the Right to Know*, 75 Harvard Law Review 1199, 1200 – 1203 (1962).

[17] 119 Congressional Record H 8836 (daily edition October 10, 1973).

regulation or other official action shall be effective unless taken, made, or enacted at such meeting."[18] (emphasis supplied). These are all final and formal actions. There are no exceptions as are contained in the statutes of some other jurisdictions. At the time of passage of the Self Government Act, several Florida court rulings were instructive. For a meeting to be public, it was not enough that it be held in a public place, it could only be deemed public if there was advance notice and reasonable opportunity for citizens to attend. *Bigelow v. Howze*, 291 So. 2d 645, 647-48 (Fla. Dist. Ct. App. 1974). And see *Hough v. Stembridge*, 278 So. 2d 288, 291 (Fla. Dist. Ct. App. 1973), where the court held, "Although the [Sunshine Law] does not specifically mention such a requirement, as a practical matter *in order for a public meeting to be in essence 'public,' we hold reasonable notice thereof to be mandatory*." (emphasis supplied).

Alternatives to Brentwood for the Bus Terminal

Defendants have not stated (1) what and how many other locations were considered; 2) what was the process of elimination; 3) what requirements are not satisfied by the other locations; 4) were any of the other locations in the heart of a residential community; 5) were any disinterested parties consulted about alternative locations;; and 7) what specifically are the requirements that are satisfied by Brentwood? The Court should also take note that there are also no declarations presented by Defendants from independent, disinterested sources; indeed no declarations from any sources whatsoever that have no interest or involvement in this matter; just threadbare claims from Defendants.

On information and belief, Complainants would proffer that there are reasonable alternatives to locating the Bus Terminal in Brentwood, alternatives whose availability, based upon the criteria set out by Defendants, is solely within the knowledge of Defendants. Indeed, if there are alternatives, set apart from residential neighborhoods, and Plaintiffs would argue that there

[18] Self Government Act, Section 742, 87 Stat. 831 (1973).

are, why have they not been pursued; why hasn't a disinterested third party been offered for guidance on this subject; and why do Defendants not disclose information about this critical mater?

Conclusion

Notwithstanding having flouted, scoffed at and wholly ignored, disregarded and disobeyed the plain, clear unambiguous language of multitudinous statutory mandates in the District of Columbia; and notwithstanding the unrebutted and uncontested admonition from a range and growing number of lettered, health experts[19] about the cumulative and ongoing threat to the health, safety and life of residents in the Brentwood Neighborhood of Washington, D.C., Respondents, in Trump-like fashion, have forged forward with the construction of a $20 million Bus Terminal, in the heart of that Community.

If Respondents are not enjoined and stopped, now, they will put at even greater risk and exposure seniors, the young and all persons affected and aggrieved. Because of the Respondents, the residents of Brentwood face, "... the potential increase in traffic-related pollutants and noise due to the bus terminal [that] can contribute further to current poor health outcomes in the Brentwood neighborhood. While CO levels projected in the air quality analysis are below NAAQS, the increases in traffic-related pollutants and noise are likely to be at a level that increases health risks for residents of all ages, starting **as early as prenatal and childhood** development." (Emphasis supplied).

In the United States Supreme Court's decision in *Tennessee Valley Authority (TVA) v. Hill*, 437 U.S. 153, 171, 195 (1978), the Court concluded that it had no choice but to enjoin the Tellico Dam project—after construction of the dam was nearly complete at a cost in excess of $150 million, based on the finding that the project would violate the Endangered Species Act. Indeed,

[19] Now numbering Fourteen (14).

injunctions are favored where harm to the environment is alleged, and some federal courts suggest that injunctions are "usual" in environmental litigation, *Monsanto Co. v. Geertson Seed Farms*, 130 S. Ct. 2743, 2756-57 (2010). The environment, once destroyed, is not likely to be repaired. Human health, safety and life, once lost, cannot be restored. Injunctive relief is the only way to preserve our air, promote green space, protect our citizens and maintain a future for those who come after us.

Respectfully Submitted,

/s/ *Johnny Barnes*
Johnny Barnes

Thursday, 12 May 2022

Cc: Lilian Dorka – Dorka.Lilian@epa.gov

Anhthu Hoang - Hoang.Anhthu@epa.gov

CERTIFICATE OF SERVICE

I hereby certify that on this 12th day of May, 2022 Respondents; The Department of Energy & Environment, Government of the District of Columbia, Mayor Elizabeth Muriel Bowser, District of Columbia, the District of Columbia Department of General Services and the District of Columbia Office of the State Superintendent of Education were served a true and accurate copy of this Complaint and annexed Exhibits by serving the appropriate Recipient:

Attorney Karl A. Racine
D.C. Attorney General
441 – 4th Street, N.W.
Washington, D.C. 20001

/s/ *Johnny Barnes*
Johnny Barnes

Thursday, 12 May 2022

October 20, 2021 *Plaintiffs' Exhibit A*

Dear Mayor Bowser and DC Council,

We are a group of health and environmental equity experts outlining potential negative impacts of the bus terminal to be located at 1601 W Street NE, in the already-burdened Brentwood neighborhood. The air quality analysis[1] predicts that even with the parking lot, NAAQS (National Ambient Air Quality Standards) will not be exceeded. This does not mean that Brentwood residents will not be negatively impacted. To the contrary, a growing body of research shows that traffic-related pollutants have lasting effects on health and wellbeing, even at levels within NAAQS. Increases in traffic-related pollutants and noise put Brentwood residents at higher health risk.

The projected increase in multiple air pollutants from roadway traffic is significant.

- The air quality analysis for the bus terminal project[2] predicts that the 8-hour average carbon monoxide (CO) from roadways in Brentwood will more than double (0.31 ppm in the future, versus 0.13 ppm currently). The 1-hour average would go up more than 50% (1.09 ppm in the future versus 0.71 ppm currently).
- While the air quality analysis did not address other traffic pollutants, increases in CO will be accompanied by co-pollutants. While gasoline-fueled school buses have lower particulate matter ($PM_{2.5}$) emissions than diesel school buses, their $PM_{2.5}$ emissions are higher than for conventional buses, and their volatile organic compound (VOC) emissions are higher than other types of buses.[3] The community can expect increases in $PM_{2.5}$, VOCs, nitrogen oxides (NOx) and ozone (O_3).

Even at levels within national standards, traffic-related pollutants have adverse effects on long-term health and well-being, especially for developing children.

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[1] Sullivan Environmental Consulting. "Air Quality Analysis for the Proposed OSSE DOT Bus Terminal Located at 1601 W Street, NE, Washington D.C." https://dgs.dc.gov/sites/default/files/dc/sites/dgs/publication/attachments/BUS-TERMINAL-Air%20Quality%20REPORT.pdf (accessed October 18, 2021).

[2] Sullivan Environmental Consulting.

[3] US EPA National Service Center for Environmental Publications. "Average In-Use Emission from Urban Buses and School Buses." https://nepis.epa.gov/Exe/ZyNET.exe/P100EVY1.TXT?ZyActionD=ZyDocument&Client=EPA&Index=2006+Thru+2010&Docs=&Query=&Time=&EndTime=&SearchMethod=1&TocRestrict=n&Toc=&TocEntry=&QField=&QFieldYear=&QFieldMonth=&QFieldDay=&IntQFieldOp=0&ExtQFieldOp=0&XmlQuery=&File=D%3A%5Czyfiles%5CIndex%20Data%5C06thru10%5CTxt%5C00000033%5CP100EVY1.txt&User=ANONYMOUS&Password=anonymous&SortMethod=h%7C-&MaximumDocuments=1&FuzzyDegree=0&ImageQuality=r75g8/r75g8/x150y150g16/i425&Display=hpfr&DefSeekPage=x&SearchBack=ZyActionL&Back=ZyActionS&BackDesc=Results%20page&MaximumPages=1&ZyEntry=1&SeekPage=x&ZyPURL (accessed October 18, 2021).

- Carbon monoxide (CO) interferes with hemoglobin's ability to transport oxygen and negatively affects the heart and lungs. Incremental increases in CO also have adverse effects on developing children, with potential for long-term effects. Fetal exposure to CO lowers math and language skills later in fourth grade,[4] and CO has been correlated with increased school absences, even at levels below NAAQS.[5] Increases in ambient CO as low as 1.4 ppm for mothers in their first trimester impact pregnancy outcomes, with lower birth weights and slower growth.[6] At levels in a similar range as projected for Brentwood by the air quality analysis, higher levels of CO have been correlated with lower birth weight and higher infant mortality.[7]
- $PM_{2.5}$ is particulate matter that is so fine that it can enter the bloodstream through the lungs. It is strongly associated with cardiovascular, respiratory problems and asthma,[8,9] and mortality.[10] $PM_{2.5}$ also affects cognitive function adversely for older adults[11,12] and increases the risk of strokes.[13] Effects of $PM_{2.5}$ are long-lasting, leading to increased mortality as long as 30 years later.[14] Even at levels below NAAQS, higher exposures to

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[4] Bharadwaj, Prashant, Matthew Gibson, Joshua Graff Zivin, and Christopher Neilson. "Gray Matters: Fetal Pollution Exposure and Human Capital Formation." *Journal of the Association of Environmental and Resource Economists* 4, no. 2 (June 2017): 505–42. https://doi.org/10.1086/691591.

[5] Currie, Janet, Eric A Hanushek, E. Megan Kahn, Matthew Neidell, and Steven G Rivkin. "Does Pollution Increase School Absences?" *Review of Economics and Statistics* 91, no. 4 (November 2009): 682–94. https://doi.org/10.1162/rest.91.4.682.

[6] Salam, Muhammad T., Joshua Millstein, Yu-Fen Li, Frederick W. Lurmann, Helene G. Margolis, and Frank D. Gilliland. "Birth Outcomes and Prenatal Exposure to Ozone, Carbon Monoxide, and Particulate Matter: Results from the Children's Health Study." *Environmental Health Perspectives* 113, no. 11 (November 2005): 1638–44. https://doi.org/10.1289/ehp.8111.

[7] Currie, Janet, Matthew Neidell, and Johannes F. Schmieder. "Air Pollution and Infant Health: Lessons from New Jersey." *Journal of Health Economics* 28, no. 3 (May 2009): 688–703. https://doi.org/10.1016/j.jhealeco.2009.02.001.

[8] Delfino, Ralph J., Jun Wu, Thomas Tjoa, Sevan K. Gullesserian, Bruce Nickerson, and Daniel L. Gillen. "Asthma Morbidity and Ambient Air Pollution: Effect Modification by Residential Traffic-Related Air Pollution." *Epidemiology* 25, no. 1 (January 2014): 48–57. https://doi.org/10.1097/EDE.0000000000000016.

[9] Pala, Daniele, José Pagán, Enea Parimbelli, Marica Teresa Rocca, Riccardo Bellazzi, and Vittorio Casella. "Spatial Enablement to Support Environmental, Demographic, Socioeconomics, and Health Data Integration and Analysis for Big Cities: A Case Study With Asthma Hospitalizations in New York City." *Frontiers in Medicine* 6 (April 24, 2019): 84. https://doi.org/10.3389/fmed.2019.00084.

[10] Chung, Yeonseung, Francesca Dominici, Yun Wang, Brent A. Coull, and Michelle L. Bell. "Associations between Long-Term Exposure to Chemical Constituents of Fine Particulate Matter ($PM_{2.5}$) and Mortality in Medicare Enrollees in the Eastern United States." *Environmental Health Perspectives* 123, no. 5 (May 2015): 467–74. https://doi.org/10.1289/ehp.1307549.

[11] Weuve, Jennifer. "Exposure to Particulate Air Pollution and Cognitive Decline in Older Women." *Archives of Internal Medicine* 172, no. 3 (February 13, 2012): 219. https://doi.org/10.1001/archinternmed.2011.683.

[12] Power, Melinda C., Marc G. Weisskopf, Stacey E. Alexeeff, Brent A. Coull, Avron Spiro, and Joel Schwartz. "Traffic-Related Air Pollution and Cognitive Function in a Cohort of Older Men." *Environmental Health Perspectives* 119, no. 5 (May 2011): 682–87. https://doi.org/10.1289/ehp.1002767.

[13] Wilker, Elissa H., Sarah R. Preis, Alexa S. Beiser, Philip A. Wolf, Rhoda Au, Itai Kloog, Wenyuan Li, et al. "Long-Term Exposure to Fine Particulate Matter, Residential Proximity to Major Roads and Measures of Brain Structure." *Stroke* 46, no. 5 (May 2015): 1161–66. https://doi.org/10.1161/STROKEAHA.114.008348.

[14] Hansell, Anna, Rebecca E Ghosh, Marta Blangiardo, Chloe Perkins, Danielle Vienneau, Kayoung Goffe, David Briggs, and John Gulliver. "Historic Air Pollution Exposure and Long-Term Mortality Risks in England and Wales: Prospective Longitudinal Cohort Study." *Thorax* 71, no. 4 (April 2016): 330–38. https://doi.org/10.1136/thoraxjnl-2015-207111.

$PM_{2.5}$ correlate with higher rates of hospitalization for respiratory and cardiovascular diseases,[15] increased mortality,[16] and decreased lung function in children.[17]

Traffic-related noise also harms health and well-being. The traffic impact study[18] outlines additional passenger car and bus trips, starting as early as 3:45 AM and at rates as high as 115 buses per hour. Environmental noise exposure has been associated with short and long-term elevations in blood pressure[19] as well as cognitive impairments in school children and in the elderly,[20] with recent mouse models suggesting both behavioural changes and increases in biomarkers for Alzheimer's Disease.[21]

The bus terminal will add these traffic-related risks to a community whose existing health inequities have been outlined in the 2018 Health Equity Report.[22] Out of the 51 proximal neighborhood groups, Brentwood ranked high in deaths due to illnesses and health outcomes for which air pollution contributes to higher risk.

- 11th in deaths due to heart disease
- 13th in deaths due to chronic lower respiratory disease
- 15th in deaths due to strokes
- 16th for lowest life expectancy at birth
- 17th in deaths due to diabetes

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[15] Makar, Maggie, Joseph Antonelli, Qian Di, David Cutler, Joel Schwartz, and Francesca Dominici. "Estimating the Causal Effect of Low Levels of Fine Particulate Matter on Hospitalization:" *Epidemiology* 28, no. 5 (September 2017): 627–34. https://doi.org/10.1097/EDE.0000000000000690.

[16] Shi, Liuhua, Antonella Zanobetti, Itai Kloog, Brent A. Coull, Petros Koutrakis, Steven J. Melly, and Joel D. Schwartz. "Low-Concentration $PM_{2.5}$ and Mortality: Estimating Acute and Chronic Effects in a Population-Based Study." *Environmental Health Perspectives* 124, no. 1 (January 2016): 46–52. https://doi.org/10.1289/ehp.1409111.

[17] Rice, Mary B., Sheryl L. Rifas-Shiman, Augusto A. Litonjua, Emily Oken, Matthew W. Gillman, Itai Kloog, Heike Luttmann-Gibson, et al. "Lifetime Exposure to Ambient Pollution and Lung Function in Children." *American Journal of Respiratory and Critical Care Medicine* 193, no. 8 (April 15, 2016): 881–88. https://doi.org/10.1164/rccm.201506-1058OC.

[18] AMT LLC Consulting Engineers. "Bus Terminal 1601 W Street, NE, Washington DC Traffic Impact Study." https://dgs.dc.gov/sites/default/files/dc/sites/dgs/publication/attachments/1601%20W%20St%20-%20Bus%20Terminal%20TIS%20Report.pdf (accessed October 18, 2021).

[19] Münzel, Thomas, Mette Sørensen, and Andreas Daiber. "Transportation Noise Pollution and Cardiovascular Disease." *Nature Reviews Cardiology* 18, no. 9 (September 2021): 619–36. https://doi.org/10.1038/s41569-021-00532-5.

[20] Thompson, Rhiannon, Rachel B. Smith, Yasmin Bou Karim, Chen Shen, Kayleigh Drummond, Chloe Teng, and Mireille B. Toledano. "Noise Pollution and Human Cognition: An Updated Systematic Review and Meta-Analysis of Recent Evidence." *Environment International* 158 (January 2022): 106905. https://doi.org/10.1016/j.envint.2021.106905.

[21] Su, Donghong, Wenlong Li, Xiaojun She, Xuewei Chen, Qingfeng Zhai, Bo Cui, and Rui Wang. "Chronic Noise Exposure Exacerbates AD-like Neuropathology in SAMP8 Mice in Relation to Wnt Signaling in the PFC and Hippocampus." *Scientific Reports* 8, no. 1 (December 2018): 14622. https://doi.org/10.1038/s41598-018-32948-4.

[22] Office of Health Equity, District of Columbia, Department of Health. "Health Equity Report: District of Columbia 2018." https://app.box.com/s/yspij8v81cxqyebl7gj3uifjumb7ufsw (accessed October 18, 2021).

Of 19 zip codes, that for Brentwood (20018) ranked 7th in pediatric asthma emergency room visits, at 304 per 10,000, whereas eight zip codes had zero. The Brentwood neighborhood already bears a disproportionate share of adverse health outcomes.

In summary, the potential increase in traffic-related pollutants and noise due to the bus terminal can contribute further to current poor health outcomes in the Brentwood neighborhood. While CO levels projected in the air quality analysis are below NAAQS, the increases in traffic-related pollutants and noise are likely to be at a level that increases health risks for residents of all ages, starting as early as prenatal and childhood development.

Thank you for your consideration in protection of health and equity.

(b) (6) Privacy, (b) (7)(C) Enforcement Privacy is an assistant professor in environmental science at American University. [redacted] studies atmospheric particulate matter from pollution and natural sources using models, satellite observations, and air quality monitors. She has held positions with GESTAR/Johns Hopkins University and NASA. [redacted] teaches courses on climate change and air pollution.

(b) (6) Privacy, (b) (7)(C) Enforcement Privacy, is Assistant Professor of Public Health at Trinity Washington University. [redacted] has worked with several government health agencies at the federal, state, and local level involving policy and program development, management, and oversight. He also served as the Director of Education for the Healthcare Council of the National Capital Area and has contributed to several local public health and environmental studies, most recently addressing COVID-19 impacts, rural health, and environmental justice.

(b) (6) Privacy, (b) (7)(C) Enforcement Privacy is associate professor of chemistry at Trinity Washington University. Her work in environmental justice grew out of a AAAS Science and Technology Policy Fellowship with US EPA. [redacted] has conducted air quality monitoring with two DC neighborhoods, Ivy City and Buzzard Point, and is the corresponding author on manuscripts that grew out of these partnerships.

(b) (6) Privacy, (b) (7)(C) Enforcement Privacy is an Assistant Research Professor of Health Policy & Management at the Milken School of Public Health at George Washington University. She has served on CDC's Advisory Committee on Childhood Lead Poisoning Prevention and EPA's Childhood Protection Advisory Committee. [redacted] conducts research in children's environmental health, with an emphasis on community based participatory methods such as health impact analysis. She is a physician by training who has managed research, risk communication, and health prevention and promotion programs for many organizations. She

currently serves on the Board of Clean Air Partners. She formerly served on the Board of Greenseal, Inc. She was appointed by the Governor of Virginia to serve on the Advisory Council on Environmental Justice for the State of Virginia, an advisory Board on environmental justice issues in the state of Virginia. She was elected to Chair that body in 2018.

(b) (6) Privacy, (b) (7)(C) Enforcement Privacy is professor of Human Science and Professor of Family Medicine at Georgetown University. She is an internist and an occupational and environmental health specialist who has previously served in a number of academic positions and as the director of the office of occupational medicine at OSHA and as the associate director for science at NIOSH/CDC. She teaches courses in environmental health, occupational and environmental toxicology, and environmental justice and conducts participatory action research with low-wage, high-risk working populations.

(b) (6) Privacy, (b) (7)(C) Enforcement Privacy is associate professor with the Maryland Institute for Applied Environmental Health and Department of Epidemiology and Biostatistic at the University of Maryland. As director of the Community Engagement, Environmental Health and Health Laboratory, (b) (6) Privacy, (b) (7)(C) Enforc engages with communities in partnership to fight environmental injustices and environmental health disparities. He is a member of the US EPA's National Environmental Justice Advisory Council (NEJAC), member of the National Academy of Science's Board on Environmental Studies and Toxicology (BEST), board member of the Citizen Science Association, Editor in Chief of Environmental Justice, a past Chair of the APHA Environment Section, former Board member of Community-Campus Partnerships for Health, and a former member of Board of Scientific Counselors for the CDC NCEH/ATSDR.

(b) (6) Privacy, (b) (7)(C) Enforcement Priva is Senior Director for Federal Strategies for Race Forward. He joined Race Forward following a long career of encouraging planning and policy solutions that are responsive to the needs of underserved communities and vulnerable populations including 20 years with the EPA. From 2015 to 2019, (b) (6) Privacy, (b) (7) completed multiple projects that served to re-energize the American Planning Association's focus on advancing equity, including chairing the Social Equity Task Force. Recently (b) (6) Privacy, (b) (7)(C was named the 2021 Sojourner Truth Fellow for Taubman College of Architecture and Urban Planning at the University of Michigan.

(b) (6) Privacy, (b) (7)(C) Enforcement Privacy is an Assistant Professor in the School of Social Transformation at Arizona State University. She specializes in social inequality, social movements and the environment. Her forthcoming book *Movement Matters: Protest, Policy and Three Decades of Environmental Justice Activism (University of California Press)* examines the political evolution of the California environmental justice movement from the 1980s to the mid 2010s. (b) (6) Privacy, (b) (7)(C) Enforc has degrees

from UC Berkeley, UC Davis, and UC Santa Cruz, and previously worked as an Assistant Professor at Howard University. See more of her work at [redacted]

[redacted] is the National Director, Policy Advocacy and Legal of the national Sierra Club. A longtime resident of Ward 6, Leslie Fields brings thirty years of federal, state, local and international environmental justice and environmental law and policy experience to the Sierra Club. She has been an adjunct law professor at Howard University School of Law. [redacted] was appointed by President Obama to serve on the Board of Directors of the Mickey Leland Urban Air Toxics Research Center. In 2018, she received the American Bar Association SEER Dedication to Diversity and Justice Award and the Sierra Club Mike McCloskey Award. In 2021, [redacted] received the Gertrude R. Rush Award from the National Bar Association. [redacted] is a graduate of Cornell University, the Georgetown University Law Center and licensed in the Commonwealth of Massachusetts, the District of Columbia and the US Supreme Court.

[redacted], is the Energy Justice Legal Director at the Center for Biological Diversity, and an Adjunct Professor at the George Washington University Law School. His work focuses on the urgent transition from a centralized fossil fuel economy to a more democratic and pollution-free energy future. He has spent his career in private and public-interest practice litigating environmental and wildlife protection, public health, safe energy, and open government cases.

[redacted] has worked on environmental justice issues for over 25 years, working directly with communities to make connections regarding the impacts of toxins on human health and the environment. Trained as an environmental scientist, she has been a lifelong advocate for communities that are disproportionately impacted by toxic chemicals from legacy contamination, ongoing exposure to polluting facilities and health-harming chemicals in household products. [redacted] resides in Washington, DC where she is the National Co-Coordinator of the Environmental Justice Health Alliance for Chemical Policy Reform (EJHA) and serves on the White House Environmental Justice Advisory Council (WHEJAC) for the Biden Administration. She continues to work in many spaces to dismantle systemic environmental racism until environmental and economic justice is achieved for all.

[redacted] is the Vice President of Environmental Justice, Climate & Community Revitalization for the National Wildlife Federation (NWF), Interim Chief of Programs at the Union of Concerned Scientists (UCS) and the Founder and CEO of Revitalization Strategies. Before joining NWF, Mustafa was the Senior Vice President for the Hip Hop Caucus (HHC), a national nonprofit and nonpartisan organization that connects the Hip Hop community to the civic process. Prior to joining the HHC, [redacted] worked 22 years at the EPA and 2 years on Capitol Hill working for Congressman John Conyers chairman of the Judiciary Committee.

[redacted] was a founding member of the EPA's Office of Environmental Justice (OEJ). He most recently served as Senior Advisor for Environmental Justice and Community Revitalization and Assistant Associate Administrator. He led the Interagency Working Group on Environmental Justice (IWG) which brought together 17 Federal Agencies & Departments and various White House offices to strategically leverage resources to uplift vulnerable communities across the country.

[redacted] is the President of the NAACP Washington, DC Branch and a member of the National Board of Directors. As President, [redacted] works to ensure the political, educational, social, and economic equality of rights of all persons and to eliminate racial discrimination in the District of Columbia. The strategic priorities for her administration include advocating for public health, environmental justice, economic empowerment, health and wellness, equal access to high-quality education and voter empowerment. She leads the implementation of programs administered by 20 standing committees, including Climate & Environmental Justice, Criminal Justice, Economic, Education, Finance, Fundraising, Health, Housing, International Affairs, Labor, Legal Redress, Membership, Political Action, Public Relations, Religious Affairs, Veteran Affairs, Women in NAACP (WIN), Young Adults, Youth Works, and the Academic, Cultural, Technological and Scientific Olympics (ACT-SO). [redacted] is also a member of the NAACP National Board of Directors.

Sarah Jane Shoenfeld
Historian/Principal, Prologue DC
sarah@prologueDC.com

PROFESSIONAL EXPERIENCE

Historian/Principal at Prologue DC, LLC. Feb 2014–present. Clients/projects include:

Mapping Segregation in Washington DC. Co-direct digital public history project documenting the former extent of racially restricted housing and other mechanisms of segregation and displacement in the nation's capital. Write and edit engaging online content for a wide audience; undertake historical research; collect and manage data; coordinate with GIS specialist to create interactive online maps; give public presentations and walking tours. Write grant proposals to support the project. Prologue DC received a 2019 District of Columbia Award for Excellence in Historic Preservation for this project.

DC Public Library. Assisted with permanent exhibit for Martin Luther King Jr. Memorial Library on the history of citizen action in the District, opening in 2021. Advised on content and design; draft and edited text panels; undertook research as needed.

DC Preservation League. Developed National Register Multiproperty Document on the 20th Century African American Civil Rights Movement in Washington DC, including historic context, criteria, and survey of all qualifying sites. Collaborated with scholars and preservation experts to establish standards for site inclusion and to develop historic narrative. Solicit public feedback via project presentations.

DC Historic Preservation Office. Selected sites and developed content for 20th Century African American Civil Rights Tour consisting of 100 locations throughout DC (2019).

Empower DC. Wrote successful historic landmark nomination for Barry Farm Dwellings; presented to Historic Preservation Review Board. Engaged in public outreach (2019).

Humanities DC. Curated Humanitini panel discussion, Julius Hobson: Maverick for Justice (Dec. 2020). Curated Humanitini panel discussion, The Humanities and the Police (2019). Reviewed grant proposals for DC Oral History Collaborative (2019).

Smithsonian's Anacostia Community Museum. Researched and advised on content for the exhibit *A Right to the City* and for the museum's 50th Anniversary Project. Wrote and edited literature review; surveyed and documented relevant archival resources and oral histories; recommended resources for digitizing; conducted oral history interviews (2017-2018).

Bloomingdale Historic Designation Coalition. Wrote 20,000-word historical narrative and gave public presentations to support a DC neighborhood's designation as a National Historic District. For this successful National Register nomination, Prologue DC and the Coalition received a 2019 Vision Award from the Committee of 100 for the Federal City (2018).

American University's Kogod School of Business. Collected images and wrote/edited/proofread captions and citations for permanent photo exhibit on DC business history.

Boss Shepherd's Restaurant. Wrote/edited/proofread text panels and image captions for exhibit on Alexander "Boss" Shepherd and the history of DC's theater district.

Cultural Tourism DC. Wrote/edited/fact-checked/proofread Neighborhood Heritage Trail booklets for public distribution.

Smithsonian Channel. Researched footage for videos featured in the Smithsonian's National Museum of African American History and Culture.

Historian/Writer/Editor/Researcher at SJS Research. 2007–2014. Clients/projects included:

DC Public Library: DC By the Book. Wrote succinct, engaging content for mobile-based historical walking tours.

Cultural Tourism DC. Researched, wrote, edited, and collected images for four DC Neighborhood Heritage Trails of 15-20 signs each (250 words per sign); fact-checked others as needed.

National Public Radio: Radio Diaries. Researched archival audio for documentary radio programs.

Film Odyssey, Inc. Researched photos and footage for nationally-broadcast PBS film *James McNeill Whistler & The Case for Beauty* (aired Sep 2014).

America I AM: The African American Imprint. Identified, located, and acquired graphics and artifacts for 12,000 square foot traveling exhibition. In addition to archival research, worked with private collectors to obtain images and objects; participated in content development meetings and edited treatments for exhibit galleries.

Avoice: African American Voices in Congress, Congressional Black Caucus Foundation. Researched and wrote content for online archive of the Congressional Black Caucus (avoiceonline.org). Collected, scanned, and catalogued photographs from the collections of current and former members of Congress. Provided background research and participated in interviews with Charles Rangel, John Conyers, Walter Fauntroy and other CBC founders.

Prior Experience

Historian, Joseph Henry Papers Project, Institutional History Division, Smithsonian Institution Archives. 2002–2007, 2010–2011. Wrote essays and identified documents and images for website on Joseph Henry, 19th-century American scientist and founding Secretary of the Smithsonian (siarchives.si.edu/history/exhibits/joseph-henry). For printed volumes, researched and wrote annotations accompanying Henry's correspondence. Produced a cumulative index for the 11-volume series, and developed web pages on the founding of the National Zoo.

Archives Technician, National Archives and Records Administration. 2001–2002. Worked with team responsible for publishing World War II-era records related to artwork and other assets looted during the Holocaust. Assessed physical condition of primary source materials to determine preservation needs; arranged records; developed descriptive finding aids for NARA's online Archival Research Catalog; and wrote pamphlets to accompany microfilm publications.

Researcher/writer, WGBH/The American Experience. 1997, 1999-2000. Researched and produced content for PBS documentaries *Africans in America* and *Jubilee Singers: Sacrifice and Glory,* and a series on education reform.

Researcher/writer, Blackside. 1997–2000. Produced print and online materials in conjunction with PBS series *Hopes on the Horizon: The Rise of the New Africa* and *I'll Make Me a World: A Century of African-American Art.*

PUBLISHED WORK

Review, *Jim Crow Capital: Women and Black Freedom Struggles in Washington, D.C., 1920-1945*, by Mary-Elizabeth Murphy, *Washington History,* Fall 2021.

Natalie Campbell and Sarah Jane Shoenfeld, "Demanding the Vote for Black Majority DC: Dr. King's Home Rule Tour," *Washington History,* Fall 2021.

"Say Their Names," *Washington History,* Fall 2020.

Review, *Black Food Geographies: Race, Self-Reliance, and Food Access in Washington, D.C.,* by Ashanté M. Reese, *Washington History,* Fall 2020.

"Barry Farm's historic landmark designation was pitted against affordable housing," *The Washington Post,* Feb. 21, 2020

"The history and evolution of Anacostia's Barry Farm," D.C. Policy Center, July 9, 2019.

"Open Data Meets History: Mapping Segregation in American Cities, Then and Now," *Open Cities: Open Data: Collaborative Cities in the Information Era* (Palgrave Mamillan, 2019).

"Mapping segregation in D.C.," D.C. Policy Center, April 23, 2019.

"'Blockbusting' and Racial Turnover in Mid-Century DC," *Washington History,* Fall 2018.

Review, *Race, Class, and Politics in the Cappucino City,* by Derek S. Hyra, *Washington History,* Spring 2018.

"Don't let development push out low-income residents," *The Washington Post,* March 23, 2018.

"How segregation shaped DC's northernmost ward," *Greater Greater Washington,* Sep 14, 2017.

"DC's Comprehensive Plan, a document we use today, preserves the racial segregation of our past," *Greater Greater Washington,* Jun 13, 2017.

"'A Strictly White Residential Section': The Rise and Demise of Racially Restrictive Covenants in Bloomingdale," *Washington History,* Spring 2017.

Review, *Just Another Southern Town: Mary Church Terrell and the Struggle for Racial Justice in the Nation's Capital,* by Joan Quigley, H-AfroAm, Feb 2017.

Review, *The Paper Bag Principle: Class, Colorism, and Rumor and the Case of Black Washington, D.C.,* by Audrey Elisa Kerr, H-DC, Aug 2007.

"Applications and Admissions to the Home for Aged Colored Women in Boston, Massachusetts, 1860–1887," *The New England Historical and Genealogical Register (*Jul 2001–Jan 2002).

Review, *Sojourner Truth: A Life, A Symbol,* by Nell Irvin Painter, *The New England Quarterly,* Dec 1997.

ACADEMIC AFFILIATIONS AND AWARDS

Senior Scholar (Non-Resident), George Washington University Institute for Public Policy

2019 District of Columbia Award for Excellence in Historic Preservation (Mapping Segregation in Washington DC)

2019 Vision Award, The Committee of 100 on the Federal City (Bloomingdale Historic District nomination)

EDUCATION

M.A. in History with Certificate in Public History. Northeastern University, Boston, MA. 1996–1999. Focused on 19th-century African-American history. Completed documentary editing project for publication in *The New England Historical and Genealogical Register*.

B.A. in Women's Studies. Earlham College, Richmond, IN. 1988–1993. College Honors.

John A. Nawn, P.E., PTOE, CFM, F. NSPE
(b) (6) Privacy, (b) (7)(C) Enforcement Privacy
(b) (6) Privacy, (b) (7)(C) Enforcement Privacy

Over 34 years' experience in Civil and Structural Engineering, specializing in Transportation Engineering, Highway, Bridge and Street Design and Construction, Transit Facility Design, Vehicle Accident Reconstruction and Human Factors related to the driving task, Building Damage Assessments, Utilities Construction, Storm Drainage, Pedestrian Safety, Walkway Surface Evaluations, Concrete and Asphalt Pavement Evaluations and building Codes and Standards and ADA compliance.

PROFESSIONAL ENGINEER: PA, NJ, MD, DE, OH, MI, MA, MO, and RI.

EDUCATION: BS in Civil Engineering (1987), Drexel University, Philadelphia, PA
MS in Civil Engineering (2012), Drexel University, Philadelphia, PA
Traffic Crash Reconstruction II (2014), Northwestern University, Evanston, IL

AWARDS:
2017 Civil Engineer of the Year, American Society of Civil Engineers, Philadelphia
2017 Delaware Valley Engineer of the Year, Delaware Valley Engineers Week
2011 State Engineer of the Year, Pennsylvania Society of Professional Engineers
2011 Delaware County Engineer of the Year, PA Society of Professional Engineer
2008 Engineering Manager of the Year, American Society of Civil Engineers, Philadelphia

ADJUNCT PROFESSOR:

Temple University, Department of Civil and Environmental Engineering; professor for two Graduate level courses; Transportation Engineering and Transportation Systems Management. (2012 to present)

Widener University, Department of Civil Engineering; professor for required undergraduate Highway Engineering Course. (2019 to present)

PROFESSIONAL BACKGROUND:

01/2022 to Present – Mid-Atlantic based Engineering and Project Management Consultant
Team member providing Project Management Oversight (PMO) services on transit, bus, and rail projects in excess of 500M on behalf of the Federal Transit Administration (FTA).

10/2021 to 12/2021– ProNet Group, Inc. – Newtown Square, Pennsylvania.
Senior Project Engineer with national Forensic Engineering and Consulting firm providing professional civil and structural engineering investigations, analyses, and evaluations to clients nationwide.

10/2012 to 9/2021 – Fleisher Forensics – Ambler, Pennsylvania.
Forensic Engineer responsible for evaluating matters involving highway and traffic engineering, including accident reconstruction, intersections; urban and rural roadways; interstate highways; parking lots; signage, pavement marking and traffic controls; codes and zoning requirements; sidewalks and crosswalks; public utilities including sanitary sewer, storm sewer and water mains. Plan and project document review; site inspections. Consulting in code compliance and standards; work zone safety, construction management, claims and safety. Evaluations of ice, snow control, grading, storm water management, detention and retention basins, and soil and sedimentation control. Walkway safety and ADA compliance analyses.

8/11 to 6/12 - Czop Specter, Inc., Worcester, PA, Executive Vice President. Executive Vice President/Chief Engineer and a member of the Board of Directors

2/10 to 8/11 - KS Engineers, P.C., Philadelphia, PA, Vice President. Manager of PA operations. Responsibilities included direction of operations, marketing & business development, technical direction, project management and application of QA/QC policies.

9/08 to 2/10 - Patrick Engineering, Wayne, PA, Business Unit Leader. Group Manager for PA Transportation Team. Responsibilities included management of technical staff and providing technical direction and quality control on bridge, roadway and utility projects.

10/05 to 8/08 - GAI Consultants, Inc., Berwyn, PA, Vice President. Managing Officer (Principal) of regional operations. Oversaw staff of design and inspection professionals providing design and construction engineering services including Civil Engineering, Highway Engineering, Traffic Engineering, Structural Engineering, Geotechnical Engineering, Environmental Engineering, Materials Testing and Inspection Services.

02/02 to 10/05: URS Corp, Phila., PA, Director Tranasportation & Municipal Eng., Branch Manager
03/01 to 02/02: DMJM+Harris, Philadelphia, PA, Project Manager
05/94 to 03/01: Valley Forge Laboratories, Inc., Devon, PA, Director Transportation Engineering
06/89 to 05/94: Remington & Vernick Engineers., Haddonfield, NJ, Municipal Project Engineer/Manager
06/87 to 06/89: NJ Department of Transportation, Trenton, NJ, Highway Project Engineer

SELECTED PROFESSIONAL EXPERIENCE

Interstate 95 Point of Access Study, *Girard Avenue Interchange, PennDOT,* Provided traffic engineering review and guidance in the development of the Point of Access Study.

Interstate 95 Cottman Avenue Interchange, *PennDOT,* Task Manager for the preparation of the multi-phase, Maintenance and Protection of Traffic Plans to support the full reconstruction of the six-lane urban interstate highway.

Northeast Extension Widening, MP A20 to A30, *Pennsylvania Turnpike Commission*, Task Leader for local road detour route evaluation & analyses to support the replacement of four bridge structures.

Mainline Widening, Valley Forge to Norristown, *Pennsylvania Turnpike Commission,* Task Leader for the traffic control design to support full detour and staged construction alternatives.

Point of Access Study Review, *PennDOT*, Provided Traffic Engineering review services on two Point of Access Studies for interstate highway access in the Pittsburgh area.

Maintenance and Protection of Traffic, *US 202, PennDOT,* Task Leader for design of Traffic Control Plans for a section of the US 202 reconstruction and widening north of Norristown.

Philadelphia International Airport Access/I-95, *PennDOT,* Task Leader for the redesign of the traffic signal systems serving the main access points to the Philadelphia International Airport.

Interstate 95, Girard Point Bridge, *PennDOT,* Task Leader for developing and estimating the Road Users Liquidated Damages clause to reduce impact & evaluate the various traffic control measures.

South Street Bridge Detour Mitigation Project, *City of Philadelphia, PA,* Project Manager for 32-signal corridor upgrade project involving signal timing and equipment improvements.

Broad Street Ice Study, *PennDOT,* Project Manager for analyses and evaluation of detour route to support temporary closure of the Roosevelt Expressway.

Maintenance & Protection of Traffic, *Kernville Viaduct & War Memorial Bridge, PennDOT*, Project Manager for design of detour route signing including re-timings of the traffic signals

Bustleton Pike Reconstruction, *PennDOT,* Project Manager, for re-alignment and reconstruction of a two-lane urban collector, to correct geometrically deficient combination horizontal and vertical curve.

Central Business District Traffic Study & Signal Design, City of Pottsville, *PA,* Optimized and coordinated the signal timings to create better levels of service. Prepared revised signal design plans.

Montoursville Airport Access Road, *PennDOT,* Task Leader for traffic engineering for a new roadway connection from the Williamsport-Lycoming County Regional Airport to the local interstate.

Interstate 80, Open Road Tolling Conversion, *Delaware River Joint Toll Bridge Commission,* Project Manager for construction engineering services to contractor on Open Road Tolling conversion project.

Schuylkill River Bridge Rehabilitations, Penrose Avenue & George C. Platt Bridges, *PennDOT* Task Leader responsible for preparation of Maintenance and Protection of Traffic Control Plans.

SR 0196-0652, Superstructure Replacement, *Design/Build, PennDOT* Project Manager for single span steel beam bridge. Included preparation of TS&L plans and calculations and final plan preparation.

SR 0309 over Toby Creek, Substructure and Superstructure repairs, *Design/Build, PennDOT* Project Manager for two single span concrete bridges on SR 0309 in Luzerne County.

SR 0502 over Springbrook Creek, Culvert Replacement, *Design/Build, PennDOT,* Project Manager for culvert replacement on SR 0502 in Lackawanna County

SR 0191-01B, Ackermanville Bridge, *Design/Build, PennDOT,* Project Manager for design of bridge and culvert replacement on SR 0191 in Northampton County.

Delaware River Bridge Scour Remediation, *Delaware River Joint Toll Bridge Commission,* Project Manager for construction engineering services on scour remediation projects on six.

Four Bridges, Delaware County, *PennDOT,* Project Leader and QA/QC manager for four bridge replacements in Delaware County.

Jim Thorpe Bridge, SR 903, *PennDOT,* Task Leader for the preliminary engineering and final design of new bridge over the Lehigh River in Jim Thorpe.

Cameron Bridge Replacement, *PennDOT,* Led the traffic engineering efforts to support the development and consideration of 14 different alternative intersection/bridge designs.

Betzwood Bridge, *PennDOT,* Task Leader for the design of three new traffic signals to accommodate the new bridge and associated new development and access points.

SR 0082 and Marriot Drive, *Coatesville, PA,* Project Manager for the design of the reconstruction of SR 0082 to support a new signalized intersection and left turn lane.

SR 0030 and Berkeley Road, *Devon, PA,* Prepared Signal Design Study, Warrant Analyses and Traffic Signal design for new signal at this intersection.

Traffic Impact Study & Traffic Signal Design, *SR 0322 & 4017, Downingtown Area School District* Project Manager for the preparation of the Traffic Impact Study and design of a new traffic signal.

Traffic Impact Study & Traffic Signal Design, *SR 0093, SR 3026, Laurel Mall Associates, PA,* Project Manager for Traffic Impact Study and the design of two traffic signals.

North Penn Signals, *PennDOT,* Provide traffic engineering and traffic signal design services to assist the completion of the final design of six revised and 5 new traffic signal projects in the Lansdale Area.

Corridor Analyses, Central Business District Parking Study & Traffic Calming Plan, *Borough of Pottstown, PA,* Project Manager, 4-lane arterial corridor within urbanized central business district.

Statewide Traffic Impact Study Reviews, *DelDOT,* Project Manager/Traffic Task Leader for the review of traffic impact studies statewide on behalf of DelDOT.

Traffic Impact Study, *Lexus of Lehigh Valley, PA,* Prepared and presented traffic study to support new automobile dealership including the re-timing of four adjacent signalized intersections.

Traffic & Parking Study, *Harrisburg International Airport,* Project Manager for the preparation of a Traffic Impact Study and Traffic Signal Plans to support the airport.

Traffic Impact Study, *Boulevard Plaza, PA,* Project Manager for preparation of access analysis and signal timing revisions for large shopping complex in northeast Philadelphia.

Traffic Impact Study, *Strath Haven MS, PA,* Project Manager to support Middle School expansion.

Traffic Study & Landside Master Plan, *Philadelphia International Airport.* Deputy Project Manager for management of data collection efforts, traffic analyses and preparation of the final report.

Transportation Master Planning, *Villanova University, PA,* Project Manager for conducting data collection, traffic models and alternative analyses including design of two new traffic signal systems.

Traffic & Civil Engineering Design, *The Ohio State University*, Project Manager for traffic and civil engineering assignments to support electrical facilities upgrades at The Ohio State University.

Municipal Traffic Impact Studies, *Whitemarsh Township, PA,* Project Manager for over three dozen traffic impact studies to support and analyze various land developments and land uses.

Borough Traffic Engineer, *Narberth, PA,* provided engineering design, review and ordinance development services on a number of traffic engineering issues.

Municipal Traffic Engineer, *Penn Township, PA,* provided engineering design, review and ordinance development services on a number of traffic engineering issues including traffic signal design.

Township Traffic Engineer, *Elk Township, PA,* Provided municipal traffic engineering support for review of land development projects and developer commissioned traffic impact studies.

Township Engineer, *Marple Township, PA* Managed municipal inspections, developed capital programs, conducted planning and zoning reviews, designed and manage annual road program.

Civil & Traffic Engineering Services, Tower Bridge Complex, *Oliver Tyrone Pulver Corp., PA* Project Manager for various traffic engineering tasks and civil engineering designs.

Construction Management Services, *Oliver Tyrone Pulver Corporation, PA,* Construction Manager for intersection reconstruction and traffic signal installation project.

Central Delaware River Waterfront Master Plan, *Delaware River Waterfront Corporation, Phila.* Project Manager, utility assessment, floodplain analysis, site assessments and pier stability assessments.

Walgreens, *Philadelphia, Pennsylvania,* Project Manager for site design and development

The Parking Spot, *Philadelphia, Pennsylvania,* Project Manager for 1000 car private parking facility

The Hickman, *Penrose Properties, PA,* Project Manager responsible for providing all civil, traffic, survey, and environmental engineering services for new multi-story, age restricted facility.

Vault Design, *Northeast Utilities, CT,* Project Manager for the design of pre-cast concrete vault covers.

Utility Coordination Research and Guidelines Development, *PennDOT,* Prepared recommendations to utility coordination procedures including recommendations for improvement to manual(s).

Dams and Lakes, Structural and Hydraulic Analyses, *Southwestern Energy Corporation, PA,* Project Manager for the structural and geotechnical investigation of two dam structures.

R-3 Line Extension, Elwyn to Media, *SEPTA,* Project Manager for 2-mile extension of rail line including track design, electrification design, communications and signaling, six bridge structures and a new ADA compliant station. Oversight of all engineering functions. (2005)

Red Rose Transit Authority, Paradise Railroad Station, Paradise, Lancaster County, PA. Project Manager responsible for the design oversight of a new rail station on Amtrak's Harrisburg Line. The project involved design of the station facilities including eastbound and westbound platforms and parking facilities for approximately 30 vehicles. Special attention was afforded for the accommodation of transit buses, ADA requirements and pedestrian facilities. Both low level and mini-high level platforms were incorporated into the design. SEPTA GEC/Warminster Station Expansion. **Signing Authority/Engineer of Record**. (2001 to 2005)

SEPTA Warminster Station. Project Manager for Transportation Impact Study to assess the impacts of the expansion of this station on the local road network. The Warminster Station is located at the northern terminus

of SEPTA's R-5 Warminster Line with the station expansion undertaken to better serve the increased patronage of the line. The expansion increased the amount of available parking by 300 spaces to create an 825-space parking facility. The work included traffic data collection, a parking utilization study, and analysis of existing traffic operations, estimation and projection of new traffic volumes resulting from the expansion, and analysis and evaluation of impacts at five, adjacent signalized intersections. Tasks also included analysis of proposed circulation patterns, parking layout and pedestrian circulation. Particular attention was paid to pedestrian and vehicle interaction, pedestrian safety and ADA compliance. (2001)

SEPTA GEC/Elm Street Station Expansion Project Manager for Transportation Impact Study to assess the impacts of the expansion of this station on the local road network. The Elm Street Station is located at the northern terminus of SEPTA's R-6 Norristown Line with the station expansion undertaken to better serve the increased patronage of the line. The expansion increased the amount of available parking by 100 spaces to create a 260-space parking facility. The work included traffic data collection, a parking utilization study, analysis of existing traffic operations, estimation and projection of new traffic volumes resulting from the expansion, and analysis and evaluation of impacts at adjacent signalized intersections. Tasks also included analysis of proposed circulation patterns, parking layout and pedestrian circulation. Particular attention was paid to pedestrian and vehicle interaction, pedestrian safety and ADA compliance. (2001)

Scour Protection for Lieutenant River Bridge, AMTRAK, *CT*, Project Director for construction drawings and environmental permitting for the construction of rock scour protection. Oversight of all engineering functions. (2008-2009)

Reconstruction of Culvert 3.35, AMTRAK, *CT*, Project Director for construction drawings and environmental permitting for relining of Culvert 3-35, due to erosion, on Amtrak's Northeast Corridor. Oversight of all engineering functions. (2008-2009)

Sharon Hill Train Station, *PA*, Project Manager for design of the historic reconstruction of station on SEPTA/Amtrak NEC including ADA compliance. Oversight of all engineering and architectural functions. (1995-2005)

Project Manager for the **Bernardsville Rail Station Improvement Project in Bernardsville, Somerset County, NJ**. This project included redesign of station platforms, reconfiguration and expansion of the 200-car parking lot, pedestrian and ADA improvements, along with drainage, landscaping and environmental permitting. (1993)

Conrail. Project Manager for a Conrail/pedestrian grade crossing project in Brooklawn, NJ. Project included new crossing signals/gates/protection, pedestrian route studies, and ADA compliance issues. (1993).

AFFILIATIONS:

- Pennsylvania Society of Professional Engineers, *Past President;*
- National Society of Professional Engineers, *Fellow;*
- Institute of Transportation Engineers, c*ertified Professional Traffic Operations Engineer;*
- American Society of Floodplain Managers, *Certified Floodplain Manager.*

NIH Biographical Sketch

BIOGRAPHICAL SKETCH

Provide the following information for the key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FOUR PAGES.**

NAME Janet A. Phoenix	POSITION TITLE Assistant Research Professor
eRA COMMONS USER NAME JPHOENIXPI	

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	YEAR(s)	FIELD OF STUDY
Mount Vernon College – Washington, DC	AA	1974	
University of Colorado – Denver, CO	B.A.	1981	Anthropology
Howard University College of Medicine – Washington, DC	MD	1989	Medicine
Bloomberg School of Public Health – Baltimore, MD	MPH	1990	Social and Behavioral Sciences

A. Personal Statement

. Janet A. Phoenix, MD, MPH is an Assistant Research Professor in the Department of Health Policy and Management in the Milken Institute School of Public Health at George Washington University. Dr. Phoenix, the Principal Investigator, manages Breathe Easy, an asthma home visiting project, for Breathe DC, a nonprofit organization dedicated to lung health. The Breathe Easy project has conducted more than 200 asthma home visits in the District of Columbia. Since joining the Department of Health Policy she has worked on child health issues. Dr. Phoenix was the recipient of a Health Policy Fellowship from the Robert Wood Johnson Foundation. She spent her fellowship year working on health care reform efforts in the US Senate. She served on two federal advisory committees, the Center for Disease Control and Prevention's Lead Poisoning Advisory Committee and the Environmental Protection Agency's Children's Health Protection Advisory Committee. She managed a six state housing intervention for the Department of Housing and Urban Development. She also managed two community based participatory research studies for HUD. She has international experience having consulted for the US Agency for International Development, Physicians for Social Responsibility and the Environmental Protection Agency in projects in Poland, Egypt, Senegal and South Africa. Dr. Phoenix designed and implemented a lead poisoning home visiting program for Health Services for Children with Special Needs, a District of Columbia managed care organization for children with special health care needs. She serves as Chairperson of the District of Columbia Department of Health Children and Youth with Special Health Care Needs Advisory Board.

Dr. Phoenix was a Co-Investigator on a national study of the implementation of asthma home visiting models in community health centers (CHAMPS) funded by the Merck Foundation. She serves as the Principal Investigator for a Community Based Participatory Research project in Wards 7 and 8

focusing on the health impact of a formerly coal fired power plant. She managed the National Lead Information Center a toll free hotline and clearinghouse for professionals and families providing information on lead poisoning prevention. She teaches public health management in the Masters in Public Health program in the Milken Institute School of Public Health. She has written on a variety of health topics including emergency preparedness, infectious diseases, AIDS, environmental lead poisoning, environmental triggers of asthma, and breast cancer. She developed and taught a course in Pandemic Flu and Emergency Preparedness. She developed and taught an evaluation course for potential grant applicants to the Komen Foundation for breast cancer in high risk African American communities. She completed training in CITI and Conduct of Scientific Research. She has a demonstrated record of successful and productive evaluation, intervention and research projects.

B. Positions and Honors

Fellowship

Robert Wood Johnson Health Policy Fellowship, 2008 – 2009. Hill Assignment: Office of Senator Orrin Hatch.

Positions

Project Director, Home Lead Assessment Project, Health Services for Children with Special Needs, Inc., 12/07-12/09
Assistant Professor, George Washington School of Public Health and Health Services, 2006 – Present.
Project Director, Lead Technical Study, Howard University Center for Urban Progress, 2004- 2007.
Executive Director, Coalition for Environmentally Safe Communities, 2003 – Present.
Manager of Public Health Programs, Environmental Health Center National Safety Council, 1992-2003.
Director of Health Education, Alliance to End Childhood Lead Poisoning, 1990-1992.

Honors

Appointed to Children's Health Protection Advisory Committee
Appointed to Centers for Disease Control and Prevention Lead Poisoning Advisory Committee

C. Publications

Most relevant to the current application

1. Breysse, J., Dixon, S., Wilson, J., Kawecki, C., Galke, W., Clark, Scott., Green, R.D., Phoenix, J.A., Selecting a Lead Hazard Control Strategy Based on Dust Lead Loading and Housing Condition: II, Application of Housing Assessment Tool (HAT) Modeling Results. Journal of Occupational and Environmental Hygiene 2008 Aug; 5:8, 540-545.
2. Brown, Phil. (editor). Getting the Lead Out of the Community. In *Perspectives in Medical Sociology.* Waveland Press Prospect Heights, Illinois 1996.
3. Bullard, R.D. (editor). Get the Lead Out. In *Confronting Environmental Racism.* South End Press, Boston, Massachusetts 1993.
4. Dixon, S., Wilson, J., Kawecki, C., Galke, W., Clark, Scott., Green, R.D., Phoenix, J.A., Selecting a Lead-Hazard Control Strategy Based on Dust Lead Loading Levels and Housing Condition. Journal of Occupational and Environmental Hygiene 2008 Aug; 5:8, 530-539.
5. Harrison, E., Monroe-Lord, L., Carson, A.D., Jean-Baptiste, A.M., Phoenix, J., Jackson, P., Harris, B.M., Asongwed, E., & Richardson, M.L. Covid-19 pandemic Related Changes in wellness behavior among older Americans. BMC Public Health 2021: 21:755. https://doi.org/10.1186/s12889-021-10825-6
6. Henry-Nickie, M., Kurban, H., Green, R.D., Phoenix, J.A., Leveling the Playing Field: Enabling Community-Based Organizations to Utilize Geographic information Systems for Effective Advocacy. Urban and Regional Information Systems Association Journal, December 2008; Volume 20, Number 1.
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10. Phoenix, J.A., Green, R.D., Thompson. A. Can Realtor Education Reduce Lead Exposure for Vulnerable Populations" July 2013. Journal of Environmental Health 76;1:28-36.
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12. Phoenix, J.A. Ethical Considerations of Research Involving Minorities, the Poorly Educated and/or Low Income Populations. Neurotoxicol Teratol. 2002 Jul-Aug: 24(4):475-6.
13. Zuckerman, D., Phoenix J.A. Treatment Options for Early Stage Breast Cancer: Information for Primary Care Providers. Clinical Review, Medscape Internal Medicine, December 2007

D. Research Support

Ongoing Research Support

Janet A. Phoenix, MD, MPH (PI) 7/11/2013 – Present

Community Based Participatory Research
Academic Service Learning

Completed projects

Janet A. Phoenix, MD, MPH (PI) 7/6/2015 Onset – 7/6/2017

Amerihealth Asthma Pilot: A Study of the Impact of Educational Tablets on Emergency room utilization and hospitalization

Janet A. Phoenix, MD, MPH (PI) 1/1/2015 – 3/31/2015

Transitions: A Case Study of the Conversion from Sheltered Workshops to Integrated Employment in Maine

Anne R. Markus, Ph.D. (PI) 10/1/2010 – 9/30/2014

"A Study of the Feasibility and Effectiveness of Improving and Evidence Based Childhood Asthma Management Intervention in Community Health Centers:
Merck Childhood Asthma Network and RCHN Community Health Foundation
10/1/2010 – 9/30/2014
Role: Colnvestigator

Rodney D. Green, Ph.D (PI) 10/2004- 09/2006
The Howard University Lead Technical Study; Source of Funds: U.S. Department of Housing and Urban Development Grant CDFA: 14.902
To engage in a community based participatory research methodology to create partnerships between faith based organizations and local health officials to lower the exposure to lead hazards for young children in the District of Columbia.
Role: Project Director

H026275 Rodney D. Green, Ph.D (PI) 10/2005-09/2007
The Howard University Lead Technical Study; Source of Funds: U.S. Department of Housing and Urban Development Grant CDFA: 14.902
To engage in a community based participatory research methodology to create partnerships between faith based organizations and local health officials to lower the exposure to lead hazards for young children in the District of Columbia.
Role: Project Director

H. ANDREW GRAY

EDUCATION

Ph.D. environmental engineering science, California Institute of Technology, Pasadena, California, 1986

M.S. environmental engineering science, California Institute of Technology, Pasadena, California, 1980

B.S. civil engineering/engineering and public policy, Carnegie-Mellon University, Pittsburgh, Pennsylvania, 1979

EXPERIENCE

Dr. H. Andrew Gray has been performing research in air pollution for over 40 years, within academic, governmental, and consulting environments. He has made significant contributions in the areas of airborne particles and visibility, including the development and application of computer-based air quality models. His areas of expertise are air pollution control strategy design and evaluation, computer modeling of the atmosphere (including AERMOD, CALPUFF, CAMx, etc.), characterization of ambient air quality and air pollutant source emissions, aerosol monitoring and modeling, visibility analysis, health impact analyses, receptor modeling, statistical data analysis, mathematical programming, numerical methods, and analysis of environmental public policy. He has evaluated air quality impacts due to hundreds of different sources, including power plants and various industrial facilities. Dr. Gray is currently an independent contractor focusing on particulate matter (and other pollutants) and visibility related research issues. Previous Gray Sky Solutions projects include assessment of Clean Air Act and other regulations on visibility in Class I (park and wilderness) areas, development of air pollution control plans and emission inventories for tribal lands, review and development of guidelines for modeling long-range transport impacts using the CALPUFF model, evaluation of particulate air quality impacts associated with diesel exhaust emissions, air quality management plan modeling protocol review, a critical review of Clean Air Mercury Rule (CAMR) documents, and assessment of the regional air quality impacts of power plant emissions. Dr. Gray has performed dispersion modeling studies to determine the impacts associated with mercury emissions in the Chesapeake Bay region, and has evaluated the air quality, visibility and health impacts of numerous electric generating facilities, industrial sources, and container ship traffic. Recently, Dr. Gray worked with a team of researchers to evaluate the health effects due to coal-fired power plant and refinery emissions throughout China, in South Africa, and in Chile. Other recent projects include modeling of SO_2 impacts in Michigan, visibility modeling in National Parks and Wilderness Areas in support of the Regional Haze Rule, modeling the impacts of large power plant emissions in Texas (litigation support), modeling the impacts of glass manufacturing and metals processing facilities in Portland, Oregon (litigation support), modeling the health effects due to a metal foundry in Oakland, CA (litigation support), evaluation of air quality impacts from quarry facilities in Ontario, modeling of refineries in Michigan, Oklahoma, Texas, New Mexico, and St. Croix, modeling and evaluation of worker exposure due to pesticide application in Central America (litigation support), and modeling of a secondary lead smelter facility in Southern California. Dr. Gray was invited by the Royal Institute of International Affairs to participate in the "Balancing Global Energy Policy Objectives: A High-Level Roundtable" meeting in April 2014.

Before starting Gray Sky Solutions, Dr. Gray was the manager of the PM_{10} and Visibility Program at Systems Applications International (SAI / ICF Inc.). At SAI, Dr. Gray conducted and managed a number of varied air pollution research projects. In the early 1990s, Dr. Gray

directed a large (over $1 million) air-quality modeling program to determine the impact of SO_2 emissions from a large coal-fired power plant on Grand Canyon sulfate and visibility levels. He managed projects to develop carbon particle emission data for the Denver area, designed a PM_{10} monitoring and modeling program for the El Paso area, determined the appropriate tradeoffs between direct PM_{10} emissions and emissions of PM_{10} precursors, estimated the visibility effects in federal Class I areas due to the 1990 Clean Air Act Amendments (results of which were incorporated into EPA's 1993 Report to Congress on the expected visibility consequences of the 1990 Clean Air Act Amendments), and provided assistance to EPA Region VIII's tribal air programs. Other projects include emission inventory development for Sacramento and carbon monoxide modeling of Phoenix, Arizona to support federal and regional implementation plans in those regions, systematic evaluation of the Interagency Workgroup on Air Quality Modeling (IWAQM) recommendations for the use of MESOPUFF II (a precursor to CALPUFF) , a critical assessment of exposures to particulate diesel exhaust in California, and an evaluation of $PM_{2.5}$ and PM_{10} air quality data in support of EPA's review of the federal particulate matter air quality standards. Later projects included a study of micrometeorology and modeling of low wind speed stable conditions in the San Joaquin Valley (CA), an assessment of the reductions in nationwide ambient particulate nitrate exposures due to mobile source NO_X emission reductions, an evaluation of visibility conditions in the Southern Appalachian Mountains region, a review of cotton ginning emission factors, and a critical review and assessment of the PM_{10} Attainment Demonstration Plan for the San Joaquin Valley. Dr. Gray was a member of the modeling subcommittee of the technical committee of the Grand Canyon Visibility Transport Commission.

Previous to his tenure at SAI, Dr. Gray was responsible for the PM_{10} and visibility programs at the South Coast Air Quality Management District which involved directing monitoring, analysis, and modeling efforts to support the design of air pollution control strategies for the South Coast Air Basin of California. He developed and applied the methodologies for assessing PM_{10} concentrations that were used by the District through numerous subsequent air quality management plan revisions. Dr. Gray authored portions of the 1989 Air Quality Management Plan issued by the District that describe the results of modeling and data analyses used to evaluate particulate matter control strategies. Dr. Gray was instrumental in promoting the development and application of state-of-science models for predicting particulate matter concentrations. His responsibilities included direction and oversight of numerous aerosol-related contracts, including development of the SEQUILIB and SAFER models, construction of an ammonia emission database, and development of sulfate, nitrate and organic chemical mechanisms. In addition, Dr. Gray was responsible for initiating the District's visibility control program.

In research performed at the California Institute of Technology, Dr. Gray studied control of atmospheric fine primary carbon particle concentrations and performed computer programming tasks for acquisition and analysis of real-time experimental data. He designed, constructed, and operated the first long-term fine particle monitoring network in Southern California in the early 1980s. He also developed and applied deterministic models to predict source contributions to fine primary carbon particle concentrations and constructed objective optimization procedures for control strategy design. In research carried out for the Department of Mechanical Engineering at Carnegie-Mellon University, Dr. Gray developed fuel use data for input to an emission simulation model for the northeastern United States.

Specialized Professional Competence

- Air pollution control strategy design
- Atmospheric air quality characterization
- Aerosols and visibility
- Computer modeling and data analysis
- Dispersion modeling for particulate matter and visibility
- Air quality health risk assessment
- Receptor modeling including Chemical Mass Balance (CMB) and factor analysis
- Analysis of environmental public policy

Professional Experience

- Systems Applications International (SAI/ICF)—PM_{10} and visibility program manager—participated in and managed numerous air quality modeling and analysis projects for public and private sector clients, with emphasis on particulate matter and visibility research
- South Coast Air Quality Management District, El Monte, California—air quality specialist—developed and applied air quality modeling analyses to support air pollution control strategy design for the South Coast Air Basin of California
- California Institute of Technology, Pasadena, California—research assistant—Ph.D. candidate in environmental engineering science. Thesis: Control of atmospheric fine primary carbon particle concentrations (thesis advisors: (b) (6) Privacy, (b) (7)(C) Enforcement Privacy (b) (6) Privacy, (b) (7)(C) Enforcement Privacy
- California Institute of Technology, Pasadena, California—laboratory assistant—performed computer programming tasks for acquisition and analysis of real-time experimental data
- Department of Mechanical Engineering, Carnegie-Mellon University, Pittsburgh, Pennsylvania—research assistant—developed fuel use data for an emissions simulation model for the northeastern United States. Grant from the U.S. Department of Energy for evaluation of national energy policy
- Department of Civil Engineering, Carnegie-Mellon University, Pittsburgh, Pennsylvania—consultant—analyzed structural retrofit design for Ferrari Dino import automobile for United States five mph crash test

HONORS AND AWARDS

Harold Allen Thomas Scholarship Award, Carnegie-Mellon University

University Honors, Carnegie-Mellon University

PROFESSIONAL AFFILIATIONS

Air and Waste Management Association

American Association for Aerosol Research

SELECTED PUBLICATIONS AND PRESENTATIONS

The Deposition of Airborne Mercury within the Chesapeake Bay Region from Coal-fired Power Plant Emission in Pennsylvania, in press (2018).

Peer Review of the Interagency Workgroup On Air Quality Modeling Phase 2 Summary Report And Recommendations For Modeling Long Range Transport Impacts (with others), Report compiled by: John S. Irwin, Air Policy Support Branch, Atmospheric Sciences Modeling Division, U.S. Environmental Protection Agency Research Triangle Park, NC 27711 (1999)

Source Contributions to Atmospheric Fine Carbon Particle Concentrations (with G.R. Cass), *Atmospheric Environment*, 32:3805-3825 (1998)

"Monitoring and Analysis of the Surface Layer at Low Wind Speeds in Stable PBL's in the Southern San Joaquin Valley of California" (with others), presented at the American Meteorological Society's 12th Symposium on Boundary Layers and Turbulence, Vancouver, British Columbia (July 1997)

"Estimation of Current and Future Year NOx to Nitrate Conversion for Various Regions of the United States" (with A. Kuklin), presented at the 90th Meeting of the Air and Waste Management Association, Toronto, Ontario (June 1997)

Integrated Monitoring Study (IMS) 1995: Characterization of Micrometeorological Phenomena: Mixing and Diffusion in Low Wind Speed Stable Conditions: Study Design and Preliminary Results (with others), in *Measurement of Toxic and Related Air Pollutants*, Air and Waste Management Association, Pittsburgh, Pennsylvania, pp. 484-500 (1996)

Regional Emissions and Atmospheric Concentrations of Diesel Engine Particulate Matter: Los Angeles as a Case Study (with G.R. Cass), in *Diesel Exhaust: A Critical Analysis of Emissions, Exposure, and Health Effects*, Health Effects Institute, Cambridge, Massachusetts, pp. 125-137 (1995)

"Assessment of the Effects of the 1990 Clean Air Act Amendments on Visibility in Class I Areas", presented at the 86th Annual Meeting & Exhibition of the Air and Waste Management Association, Denver, Colorado (June 1993)

"Source Contributions to Atmospheric Carbon Particle Concentrations" (with others), presented at the Southern California Air Quality Study Data Analysis Conference, Los Angeles, California (July 1992)

"Modeling Wintertime Sulfate Production in the Southwestern United States" (with M. Ligocki), presented at the AWMA/EPA International Specialty Conference on PM10

Standards and Nontraditional Particulate Source Controls, Scottsdale, Arizona (January 1992)

"Deterministic Modeling for the Navajo Generating Station Visibility Impairment Study: An Overview," presented at the 84th Meeting of the Air and Waste Management Association, Vancouver, British Columbia (June 1991)

"Receptor and Dispersion Modeling of Aluminum Smelter Contributions to Elevated PM10 Concentrations" (with R. G. Ireson and A. B. Hudischewskyj), presented at the 84th Meeting of the Air and Waste Management Association, Vancouver, British Columbia (June 1991)

Visibility and PM-10 in the South Coast Air Basin of California (with J.C. Marlia), in *Visibility and Fine Particles*, Air and Waste Management Association, Pittsburgh, Pennsylvania, pp. 468-477 (1990)

Chemical characteristics of PM10 aerosols collected in the Los Angeles area (with others), *J. Air Pollut. Control Assoc.*, 39:154-163 (1989)

Atmospheric carbon particles and the Los Angeles visibility problem (with others), *Aerosol Sci. Technol.*, 10:118-130 (1989)

Receptor modeling for PM10 source apportionment in the South Coast Air Basin of California (with others), in *PM-10: Implementation of Standards*, Air Pollution Control Association, Pittsburgh, Pennsylvania, pp. 399-418 (1988)

Optimization of PM10 control strategy in the South Coast Air Basin (with others), in *PM-10: Implementation of Standards*, Air Pollution Control Association, Pittsburgh, Pennsylvania, pp. 589-600 (1988)

Quantitative high-resolution gas chromatography and high-resolution gas chromatography/mass spectrometry analyses of carbonaceous fine aerosol particles (with others), *Int. J. Environ. Anal. Chem.*, 29:119-139 (1987)

"Development of an Objective Ozone Forecast Model for the South Coast Air Basin" (with others), presented at the 80th Meeting of the Air Pollution Control Association, New York (June 1987)

"PM10 Modeling in the South Coast Air Basin of California" (with others), presented at the 79th Annual Meeting of the Air Pollution Control Association, Minneapolis, Minnesota (1986)

Characteristics of atmospheric organic and elemental carbon particle concentrations in Los Angeles (with others), *Environ. Sci. Technol.*, 20:580-589 (1986)

"Chemical Speciation of Extractable Organic Matter in the Fine Aerosol Fraction" (with others), presented at the 1984 International Chemical Congress of Pacific Basin Societies, Honolulu, Hawaii (1984)

"Source Contributions to Atmospheric Carbon Particle Concentrations" (with others), presented at the First International Aerosol Conference, Minneapolis, Minnesota (1984)

Elemental and organic carbon particle concentrations: A long term perspective (with others), *Sci. Total Environ.*, 36:17-25 (1984)

"Meteorological and Chemical Potential for Oxidant Formation" (with others), presented at the Conference on Air Quality Trends in the South Coast Air Basin, California Institute of Technology, Pasadena, California (1980)

Containing recombinant DNA: How to reduce the risk of escape (with others), *Nature*, 281:421-423 (1979)

OTHER PUBLICATIONS

"Lead Deposition from the Vernon Lead Smelter Facility", prepared for the Office of the Attorney General, California Department of Justice, San Diego, CA (2022)

"Modeling of PM Emissions from the Voestalpine Facility", prepared for Environmental Integrity Project, Washington, DC (2021)

"Exposures of DBCP to Banana Plantation Workers During 1969-1978", prepared on behalf of Plaintiffs, Patrickson et al. v. Dole Food Company et al. (Case No. 07-1-0047 GWBC), State of Hawaii (2021)

"Dispersion Modeling of the AB&I Metal Foundry Facility", prepared for the Office of the Attorney General, California Department of Justice, Oakland, CA (2021)

"Dispersion Modeling of NO_2 Impacts from Gas-fired Power Plants", prepared for Dr. Ron Sahu (2021)

"Modeling the SO_2 Impacts From Intermittent Flare Events in Ector County, Texas", prepared for Environmental Integrity Project, Washington, DC (2020)

"Sulfur Dioxide Modeling for Wayne County, Michigan" prepared for Sierra Club, San Francisco, CA (2020)

"CALPUFF Modeling of Michigan Power Plants", prepared for the University of Michigan, Ann Arbor, MI (2020)

"Air Quality Impacts and Health Effects Due to Large Stationary Source Emissions In and Around South Africa's Mpumalamga Highveld Priority Area", prepared for the Centre for Environmental Rights (2019)

"Review of KMP Dispersion Modeling and the EEM Plan", prepared for te Pacific Centre for Environmental Law and Litigation, Vicoria, BC (2019)

"Precision Castparts PM Modeling", prepared on behalf of Plaintiffs, Resendez, et al. v. Precision Castparts Corp. and PCC Structurals, Inc. (Case No. 16CV16164), Portland, Oregon (2019)

"Review of GHD's Modeling Assessment and Analysis of the Coal-fired Power Stations in the Latrobe Valley", prepared on behalf of Environmental Justice Australia (2018)

"Modeling PM Air Quality Impacts of the Proposed OBOT Facility", prepared on behalf of Defendants, Oakland Bulk & Oversized Terminal, LLC, vs. City of Oakland (Case No. 16-CV-7014), Oakland, CA (2017)

"Bullseye Glass PM_{10} Modeling", prepared on behalf of Plaintiffs, Meeker et al. v. Bullseye Glass Co. (Case No. 16-CV-07002), Portland Oregon (2017)

"Visibility and Health Modeling: Technical Support Document to Comments of Conservation Organizations; EPA's Proposed Promulgation of Air Quality Implementation Plans, State of Texas; Regional Haze and Interstate Visibility Transport Federal Implementation Plan, 82 Fed. Reg. 912 (proposed Jan. 4, 2017), EPA Docket No. EPA-R06-2016-0611; FRL-995-77-Region 6", prepared on behalf of the National Parks Conservancy Association, Washington, DC (2016)

"Visibility and Health Modeling: Technical Support Document to Comments of Conservation Organizations; EPA's Proposed Partial Approval and Partial Disapproval of Texas Regional Haze State Implementation Plan, Partial Disapproval of Oklahoma's State Implementation Plan, and Proposed Federal Implementation Plans for Texas and Oklahoma for the First Planning Period of 2008 through 2018", prepared on behalf of the Sierra Club, San Francisco, CA (2016).

"Comments on EPA's Co-Proposal for the State of Utah's Regional Haze State Implementation Plan (Docket ID No. EPA-R08-OAR-2015-0463)", prepared on behalf of the Sierra Club, San Francisco, CA (2016).

"Evaluation of MDEQ's May 31, 2016 Proposed Sulfur Dioxide One-Hour National Ambient Air Quality Standard State Implementation Plan", prepared on behalf of Sierra Club, San Francisco, CA (2016)

"Sierra Club v. Union Electric Co., dba Ameren Missouri U.S. District Court for the Eastern District of Missouri, Case No. 14-cv-00408", prepared on behalf of Sierra Club, San Francisco, CA (2016)

"Comments on MDEQ's Proposed Sulfur Dioxide One-Hour National Ambient Air Quality Standard State Implementation Plan (dated August 20, 2015)", expert report prepared on behalf of Sierra Club, San Francisco, CA (2015)

"Natural Resources Defense Council, Inc., Sierra Club, Inc., and Respiratory Health Association (Plaintiffs) v. Illinois Power Resources, LLC and Illinois Power Resources Generating, LLC (Defendants)", expert report prepared on behalf of Natural Resources Defense Council (2015)

"Visibility Modeling: Technical Support Document to Comments of Conservation Organizations; EPA's Proposed Federal Implementation Plan for Arkansas for the First Planning Period of 2008 through 2018", prepared on behalf of Sierra Club, San Francisco, CA and National Parks Conservancy Association, Washington, DC (2015)

Modeling the Visibility Impacts at Class I Areas due to Emissions from the Hunter, Huntington, and Carbon Power Plants, prepared on behalf of the National Parks Conservancy Association, Washington, DC (2015)

"Visibility and Health Modeling: Technical Support Document to Comments of Conservation Organizations; EPA's Proposed Partial Approval and Partial Disapproval of Texas Regional Haze State Implementation Plan, Partial Disapproval of Oklahoma's State Implementation Plan, and Proposed Federal Implementation Plans for Texas and Oklahoma for the First Planning Period of 2008 through 2018, prepared on behalf of the National Parks Conservancy Association, Washington, DC (2015)

"Modeling of SO2 Sources in the Wayne County Non-Attainment Area", prepared on behalf of Sierra Club, San Francisco, CA (2015)

"The Role of the Regional Haze Rule in Restoring Clean Air at National Parks and Wilderness Areas: Exploring the Impact of Regulatory Interaction on Power Plant Emissions and Visibility in Class I Areas", report prepared (with others) on behalf of the National Parks Conservancy Association, Washington, DC (2015)

"Review of Illinois 2014 SO_2 Ambient Air Monitoring Network", prepared on behalf of Sierra Club, San Francisco, CA (2015)

"Review of Missouri's 2014 SO_2 Ambient Air Monitoring Network", prepared on behalf of Sierra Club, San Francisco, CA (2014)

"Review of Michigan's 2014 SO_2 Ambient Air Monitoring Network", prepared on behalf of Sierra Club, San Francisco, CA (2014)

"Atmospheric Dispersion Modeling of Coal-Fired Power Plant Emissions in China", prepared on behalf of Greenpeace International (2013)

"Modeling the Air Quality Impacts of Shipping Emissions", prepared on behalf of Kelley Drye and Warren (2012)

"Cypress Creek Power Plant Modeling: Pollutant Deposition to the Chesapeake Bay and Sensitive Watersheds within the Commonwealth of Virginia," prepared on behalf of the Chesapeake Bay Foundation, Annapolis, MD (2009)

"Virginia City Power Plant Modeling," prepared on behalf of the Chesapeake Bay Foundation, Annapolis, MD (2008)

"Chesterfield Power Plant Modeling," prepared on behalf of the Chesapeake Bay Foundation, Annapolis, MD (2008)

"The Deposition of Airborne Mercury in Pennsylvania," prepared on behalf of the Chesapeake Bay Foundation, Annapolis, MD (2007)

"The Deposition of Airborne Mercury in Virginia," prepared on behalf of the Chesapeake Bay Foundation, Annapolis, MD (2007)

"Pollutant Deposition from Maryland Sources," prepared on behalf of the Chesapeake Bay Foundation, Annapolis, MD (2006)

"Air Quality Modeling and Visibility Impacts Associated with Sammis Power Plant Emissions," prepared on behalf of the United States of America, Washington, D.C. (2003)

"Air Quality Modeling and Visibility Impacts Associated with Baldwin Power Plant Emissions," prepared on behalf of the United States of America, Washington, D.C. (2002)

"Assessment of the Impacts of Clean Air Act and Other Provisions on Visibility in Class I Areas" (with others), prepared for American Petroleum Institute, Washington, D.C. (1998)

"California Regional PM10 Air Quality Study: *1995 Integrated Monitoring Study Data Analysis: Time and Length Scales for Mixing Secondary Aerosols During Stagnation Periods"* (with others), prepared for California Air Resources Board, Sacramento (1997)

"San Joaquin Valley Regional PM10 Study*: Characterizing Micrometeorological Phenomena: Mixing and Diffusion in Low Wind Speed Conditions Phase III: Monitoring and Data Analysis"* (with others), prepared for California Air Resources Board, Sacramento (1997)

"Cotton Gin Particulate Emission Factors," prepared for U.S. Environmental Protection Agency, Region VIII, San Francisco, California (1997)

"Benefits of Mobile Source NOx Related Particulate Matter Reductions" (with A. Kuklin), SYSAPP-96/61, prepared for Office of Mobile Sources, U.S. Environmental Protection Agency, Ann Arbor, Michigan (1996)

"Evaluation of Existing Information on the Effects of Air Pollutants on Visibility in the Southern Appalachians" (with D. Kleinhesselink), SYSAPP-96-95/060, prepared for Southern Appalachian Mountains Initiative, Asheville, North Carolina (1996)

"Statistical Support for the Particulate Matter NAAQS" (with others), SYSAPP-96-95/039, prepared for Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina (1996)

"San Joaquin Valley Regional PM10 Study Support Study 5A: *Characterizing Micrometeorological Phenomena: Mixing and Diffusion in Low Wind Speed Conditions Phase II: Detailed Recommendations for Experimental Plans*" (with others), prepared for California Air Resources Board, Sacramento (1995)

"San Joaquin Valley Regional PM10 Study Support Study 5A: *Characterizing Micrometeorological Phenomena: Mixing and Diffusion in Low Wind Speed Conditions Phase I: Literature Review and Draft Program Recommendations*" (with others), prepared for California Air Resources Board, Sacramento (1995)

"Class I Grouping for Subsequent Assessment of Regional Haze Rules" (with others), SYSAPP-94/129, prepared for Air Quality Strategies and Standards Division, Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina (1994)

"Retrospective Analysis of the Impact of the Clean Air Act on Urban Visibility in the Southwestern United States" (with C. Emery and T.E. Stoeckenius), SYSAPP-94/108, prepared for Office of Policy Analysis and Review, Office of Air and Radiation, U.S. Environmental Protection Agency, Washington, D.C. (1994)

"Evaluation of Ambient Species Profiles, Ambient Versus Modeled NMHC:NO_x and CO:NO_x Ratios, and Source-Receptor Analyses" (with G. Yarwood, M. Ligocki, and G.

Whitten), SYSAPP-94/081, prepared for Office of Mobile Sources, U.S. Environmental Protection Agency, Ann Arbor, Michigan (1994)

"Diesel Particulate Matter in California: Exposure Assessment" (with M. Ligocki and A. Rosenbaum), SYSAPP-94/077, prepared for Engine Manufacturers Association, Chicago, Illinois (1994)

"Interagency Workgroup on Air Quality Modeling (IWAQM): Assessment of Phase I Recommendations Regarding the Use of MESOPUFF II" (with M. Ligocki and C. Emery), SYSAPP-94/030, prepared for Source Receptor and Analysis Branch, Technical Services Division, Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina (1994)

"Analysis of the 1991-1992 Pine Bend Monitoring Data" (with others), SYSAPP-94/007, prepared for Minnesota Pollution Control Agency, St. Paul, Minnesota (1994)

"Assessment of the Effects of the 1990 Clean Air Act Amendments on Visibility in Class I Areas" (with others), SYSAPP-93/162, prepared for Ambient Standards Branch, Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina (1994)

"Revised Base Case and Demonstration of Attainment for Carbon Monoxide for Maricopa County, Arizona" (with others), SYSAPP-94-93/156s, prepared for Maricopa Association of Governments, Phoenix, Arizona (1994)

"Sacramento FIP 2005 Modeling Inventory" (with others), SYSAPP-93/237, prepared for Pacific Environmental Services, North Carolina, and U.S. Environmental Protection Agency, Region IX, San Francisco, California (1993)

"Carbon Monoxide Modeling in Support of the 1993 State Implementation Plan for Maricopa County, Arizona" (with others), SYSAPP-93/156, prepared for Maricopa Association of Governments, Phoenix, Arizona (1993)

"Air Quality Modeling of Carbon Monoxide Concentrations in Support of the Federal Implementation Plan for Phoenix, Arizona" (with others), SYSAPP-93/039, prepared for Pacific Environmental Services, North Carolina, and U.S. Environmental Protection Agency, Region IX, San Francisco, California (1993)

"Base Case Carbon Monoxide Emission Inventory Development for Maricopa County, Arizona" (with others), SYSAPP-93/077, prepared for Maricopa Association of Governments, Phoenix, Arizona (1993)

"Sacramento FIP Modeling 3: Future Emissions Inventory" (with others), SYSAPP-93/036, prepared for Pacific Environmental Services, Inc., North Carolina and U.S. Environmental Protection Agency, San Francisco (1993)

"Emissions Inventory Development for the Tribal Air Program" (with M. Causley and S. Reid), SYSAPP-92/146, prepared for U.S. Environmental Protection Agency, Region VIII, Denver, Colorado (1992)

"Carbon Particle Emissions Inventory for Denver Brown Cloud II: Development and Assessment" (with S. B. Reid and L. R. Chinkin), prepared for Colorado Department of Health, Denver, Colorado (1992)

"Analysis to Determine the Appropriate Trade-off Ratios Between NO_x, SO_x, and PM10 Emissions for the Shell Martinez Refinery" (with M. Ligocki), SYSAPP-92/006, prepared for Shell Oil Co., Martinez, California (1992)

"Modeling Program for PM-10 State Implementation Plan Development for the El Paso/Ciudad Juarez Airshed" (with C. Emery and M. Ligocki), SYSAPP-91/134, prepared for U.S. Environmental Protection Agency, Dallas Texas (1991)

"Deterministic Modeling for Navajo Generating Station Visibility Study. Volume I. Technical Report" (with others), SYSAPP-91/045a, prepared for Salt River Project, Phoenix, Arizona (1991)

"Deterministic Modeling in the Navajo Generating Station Visibility Study" (with others), SYSAPP-91/004, prepared for Salt River Project, Phoenix, Arizona (1991)

"Analysis of Contributions to PM10 Concentrations During Episodic Conditions" (with A. B. Hudischewskyj and R. G. Ireson), SYSAPP-90/072, prepared for Kaiser Aluminum and Chemical Corporation (1990)

"Preparation of Elemental and Organic Carbon Particle Emission Inventories for the Denver Area: Work Plan" (with L. R. Chinkin), SYSAPP-90/068, prepared for Colorado Department of Health (1990)

"Evaluation of Control Strategies for PM10 Concentrations in the South Coast Air Basin," Air Quality Management Plan: 1988 Revision, Appendix V-O. South Coast Air Quality Management District, El Monte, California (1988)

"Annual PM10 Dispersion Model Development and Application in the South Coast Air Basin," Air Quality Management Plan: 1988 Revision, Appendix V-L. South Coast Air Quality Management District, El Monte, California (1988)

"PM10 Modeling Approach" (with others), 1987 AQMP Revision Working Paper No. 2, South Coast Air Quality Management District, El Monte, California (1986)

"Workplan for Air Quality Modeling and Analysis," 1987 AQMP Revision Working Paper No. 5, Planning Division, South Coast Air Quality Management District, El Monte, California (1986)

"Control of Atmospheric Fine Primary Carbon Particle Concentrations," (EQL report No. 23), Ph.D. thesis, California Institute of Technology, Pasadena, California (1986)

"Policy on Recombinant DNA Activities: Relaxing Guidelines While Increasing Safety," project report, Department of Engineering and Public Policy, Carnegie-Mellon University, Pittsburgh, Pennsylvania (1978)

"Air Pollution Control Analyses for State Implementation Plan Revisions in Allegheny County," project report, Department of Engineering and Public Policy, Carnegie-Mellon University, Pittsburgh, Pennsylvania (1978)

EMPLOYMENT HISTORY

Systems Applications International	Manager, PM_{10} and Visibility Program	1989–1997
South Coast Air Quality Management District	Air Quality Specialist	1985–1989
California Institute of Technology, Pasadena, California	Research Assistant Laboratory Assistant	1979–1985 1979
Carnegie-Mellon University, Dept. of Mechanical Engineering Pittsburgh, Pennsylvania	Research Assistant	1978–1979

Daniel L. Goldberg, Ph.D.

Assistant Research Professor
George Washington University
Email: dgoldberg@email.gwu.edu
(b) (6) Privacy, (b) (7)(C) Enforcement Privacy

Professional Preparation

2015	Ph.D.	University of Maryland, Atmospheric & Oceanic Science
2013	M.S.	University of Maryland, Atmospheric & Oceanic Science
2009	B.S.	Lafayette College, Chemical Engineering

Professional Appointments

2021–present	Assistant Research Professor	George Washington University
2019–2021	Staff Research Scientist	George Washington University
2019–2021	Staff Research Scientist	Argonne National Laboratory
2016–2019	Postdoctoral Scientist	Argonne National Laboratory
2010–2015	Graduate Research Assistant	University of Maryland
2009–2010	Environmental Engineer	TRC Solutions

Scientific and Technical Background

Dr. Goldberg combines satellite data with model output and measurement data to quantify the human exposures to air pollution around the world. His most recent work involves using the TROPOMI satellite instrument to identify changes in air pollution emissions and concentrations due to the COVID-19 lockdowns. Results from his ongoing analyses have allowed the scientific community to gain better insight on NOx and GHG emissions on a city-scale, and to better estimate pollutant exposures for health impact assessments. He holds a "Tiger Team" leadership position on the NASA HAQAST science team, and has made impactful contributions to several additional NASA-sponsored science teams, including DISCOVER-AQ, KORUS-AQ, and OWLETS-2. He actively collaborates with scientists and policymakers at NASA, NOAA, EPA, IHME, CDC, state agencies, non-profit organizations, and other academic institutions.

Service & Leadership

2021-2022	Technical Advisory	Metro Washington DC Air Quality Committee
2021	Mentor	NASA DEVELOP Internship Program
2021	Session Organizer	American Meteorological Society
2019–2020	Session Organizer	American Geophysical Union
2016–2018	Executive Board Member	Argonne Postdoctoral Society
2016–2017	Mentor	ACT-SO High School Science Competition
2011–2013	Executive Board Member	UMD Atmospheric Science Graduate Students
2007–2008	Student President	Lafayette College Environmental Club

Awards & Honors

2020	Impact Argonne Award for Extraordinary Effort
2015	Outstanding Graduate Assistant Award for top 2% of all graduate students
2012	Service Award for dedicated service to UMD Atmospheric Science Dept
2009	American Chemical Society (ACS) Award for top chemical engineer in class
2008	Tau Beta Pi Engineering Honor Society for top 20% of engineering class

Teaching Experience

2020 – 2021 George Washington University, Global Climate Change and Air Pollution
Guest Lecture on the use of measurements and models to estimate air pollution

2012 – 2013 University of Maryland, AOSC200: Introduction to Weather and Climate
Head TA. Taught 2 lectures per week. Graded all exams, quizzes, and projects.

Junior Scientists Advised

(b) (6) Privacy, (b) (7)(C) Enforcement Privacy

Related Professional Experience

2012 – 2014	National Atmospheric Deposition Program Primary Site Operator
2012 – 2014	Clean Air Status & Trends Network Primary Site Operator

Editorial Review

Peer reviewer for academic journals: Atmospheric Chemistry and Physics (6); Atmospheric Environment (7); Atmospheric Measurement Techniques (1); Atmosphere (3); Environmental Research Letters (4); Environmental Science and Technology (4); Elementa (2); Geophysical Research Letters (2); Journal of Atmospheric and Oceanic Technology (1); Journal of Geophysical Research – Atmospheres (1); Nature Communications (1); Remote Sensing (2); Science of the Total Environment (1); Scientific Advances (1)

Peer reviewer for academic proposals: NASA Research Opportunities in Space and Earth Science (ROSES), NASA Postdoctoral Program (NPP), National Science Foundation (NSF), Netherlands Organization for Scientific Research Innovational Research Incentives Scheme (Vici)

Professional Membership

American Geophysical Union (AGU)
American Meteorological Society (AMS)
International Society for Environmental Epidemiology (ISEE)

Skills & Proficiencies

Mastery of:	TROPOMI (NO_2, HCHO, CO) OMI (NO_2, HCHO, SO_2), MODIS AOD (Dark Target & Deep Blue), MAIAC AOD, CAMx air quality model, IDL, Linux, HDF & NetCDF file formats
Understanding of:	WRF, ERA5 re-analysis, CMAQ, WRF-Chem, Geos-Chem, Python, Visual Basic, HTML, C-shell, Fortran

Peer-Reviewed Publications (12 first-author, 30 total; h-index: 14)

1. Tzortziou, M., Kwong, C. F., **Goldberg, D. L.,** Schiferl, L., Commane, R., Abuhassan, N., Szykman, J. and Valin, L.: Declines and peaks in NO_2 pollution during the multiple waves of the COVID-19 pandemic in the New York metropolitan area, Atmos. Chem. Phys., 1–30, doi:10.5194/ACP-2021-592, **2022**.
2. Jing, P. and **Goldberg, D. L.:** Influence of conducive weather on ozone in the presence of reduced NOx emissions: A case study in Chicago during the 2020 lockdowns, Atmos. Pollut. Res., 13(2), 101313, doi:10.1016/J.APR.2021.101313, **2022**.
3. Anenberg, S. C., Mohegh, A., **Goldberg, D. L.,** Kerr, G. H., Brauer, M., Burkart, K., Hystad, P., Larkin, A., Wozniak, S. and Lamsal, L.: Long-term trends in urban NO_2 concentrations and associated paediatric asthma incidence: estimates from global datasets, Lancet Planet. Heal., 6(1), e49–e58, doi:10.1016/S2542-5196(21)00255-2, **2022**.
4. Nawaz, M. O., Henze, D. K., Harkins, C., Cao, H., Nault, B., Jo, D., Jimenez, J., Anenberg, S. C., **Goldberg, D. L.** and Qu, Z.: Impacts of sectoral, regional, species, and day-specific emissions on air pollution and public health in Washington, DC, Elem. Sci. Anthr., 9(1), doi:10.1525/elementa.2021.00043, **2021**.
5. Laughner, J. L., ..., **Goldberg, D. L.,** ..., Zeng, Z.-C.: Societal shifts due to COVID-19 reveal large-scale complexities and feedbacks between atmospheric chemistry and climate change, *Proc. Natl. Acad. Sci.,* 118(46), doi:10.1073/PNAS.2109481118, **2021.**
6. **Goldberg, D. L.,** Anenberg, S. C., Lu, Z., Streets, D. G., Lamsal, L., McDuffie, E. and Smith, S.: Urban NOx emissions around the world declined faster than anticipated between 2005 and 2019, *Environ. Res. Lett.,* doi:10.1088/1748-9326/AC2C34, **2021.**
7. **Goldberg, D. L.,** Anenberg, S. C., Kerr, G. H., Lu, Z. and Streets, D. G.: TROPOMI: A revolutionary new satellite instrument measuring NO_2 air pollution, *Environ. Manag.,* **2021.**
8. Anenberg, S., Kerr, G. H. and **Goldberg, D. L.**: Leveraging satellite data to address air pollution inequities, *Environ. Manag.,* **2021.**
9. Kondragunta, S., Wei, Z., McDonald, B. C., **Goldberg, D. L.** and Tong, D. Q.: COVID-19 Induced Fingerprints of a New Normal Urban Air Quality in the United States, *J. Geophys. Res. Atmos.*, e2021JD034797, doi:10.1029/2021JD034797, **2021.**
10. Kerr, G. H., **Goldberg, D. L.** and Anenberg, S. C.: COVID-19 pandemic reveals persistent disparities in nitrogen dioxide pollution, *Proc. Natl. Acad. Sci.,* 118(30), e2022409118, doi:10.1073/pnas.2022409118, **2021.**
11. **Goldberg, D. L.,** Anenberg, S. C., Mohegh, A., Lu, Z. and Streets, D. G.: TROPOMI NO_2 in the United States: A detailed look at the annual averages, weekly cycles, effects of temperature, and correlation with surface NO_2 concentrations, *Earth's Future,* doi: 10.1029/2020EF001665, **2021.**
12. Gorris, M. E., Anenberg, S. C., **Goldberg, D. L.,** Kerr, G. H., Stowell, J. D., Tong, D. and Zaitchik, B. F.: Shaping the future of science: COVID-19 highlighting the importance of GeoHealth, GeoHealth, 5(5), e2021GH000412, doi:10.1029/2021gh000412, **2021.**
13. **Goldberg, D. L.,** Anenberg, S. C., Griffin, D., McLinden, C. A., Lu, Z. and Streets, D. G.: Disentangling the Impact of the COVID-19 Lockdowns on Urban NO_2 From Natural Variability, *Geophys. Res. Lett.,* 47(17), doi:10.1029/2020GL089269, **2020.**

14. Mohegh, A., **Goldberg, D. L.,** Achakulwisut, P. and Anenberg, S. C.: Sensitivity of estimated NO_2 -attributable pediatric asthma incidence to grid resolution and urbanicity, *Environ. Res. Lett.,* doi:10.1088/1748-9326/abce25, **2020.**
15. Anenberg, S. C., Bindl, M., Brauer, M., Castillo, J. J., Cavalieri, S., Duncan, B. N., Fiore, A. M., Fuller, R., **Goldberg, D. L.,** Henze, D. K., Hess, J., Holloway, T., James, P., Jin, X., Kheirbek, I., Kinney, P. L., Liu, Y., Mohegh, A., Patz, J., Jimenez, M. P., Roy, A., Tong, D., Walker, K., Watts, N. and West, J. J.: Using Satellites to Track Indicators of Global Air Pollution and Climate Change Impacts: Lessons Learned From a NASA-Supported Science-Stakeholder Collaborative, *GeoHealth,* 4(7), doi:10.1029/2020GH000270, **2020.**
16. Saide, P. E., Gao, M., Lu, Z., **Goldberg, D. L.,** Streets, D. G., ... , and Crawford, J. H.: Understanding and improving model representation of aerosol optical properties for a Chinese haze event measured during KORUS-AQ, *Atmos. Chem. Phys.*, 20(11), 6455–6478, doi:10.5194/acp-20-6455-2020, **2020.**
17. Liu, F., Duncan, B. N., Krotkov, N. A., Lamsal, L. N., Beirle, S., Griffin, D., McLinden, C. A., **Goldberg, D. L.** and Lu, Z.: A methodology to constrain carbon dioxide emissions from coal-fired power plants using satellite observations of co-emitted nitrogen dioxide, *Atmos. Chem. Phys.,* 20(1), 99–116, doi:10.5194/acp-20-99-2020, **2020.**
18. **Goldberg, D. L.,** Saide, P. E., Lamsal, L. N., De Foy, B., Lu, Z., Woo, J.-H., Kim, Y., Kim, J., Gao, M., Carmichael, G. and Streets, D. G.: A top-down assessment using OMI NO_2 suggests an underestimate in the NOx emissions inventory in Seoul, South Korea, during KORUS-AQ, *Atmos. Chem. Phys.,* 19(3), doi:10.5194/acp-19-1801-2019, **2019.**
19. **Goldberg, D. L.,** Lu, Z., Streets, D. G., de Foy, B., Griffin, D., McLinden, C. A., Lamsal, L. N., Krotkov, N. A. and Eskes, H.: Enhanced Capabilities of TROPOMI NO_2 : Estimating NOx from North American Cities and Power Plants, *Environ. Sci. Technol.,* acs.est.9b04488, doi:10.1021/acs.est.9b04488, **2019.**
20. **Goldberg, D. L.,** Lu, Z., Oda, T., Lamsal, L. N., Liu, F., Griffin, D., McLinden, C. A., Krotkov, N. A., Duncan, B. N. and Streets, D. G.: Exploiting OMI NO_2 satellite observations to infer fossil-fuel CO_2 emissions from U.S. megacities, Sci. Total Environ., 695, 133805, doi:10.1016/j.scitotenv.2019.133805, **2019.**
21. **Goldberg, D. L.,** Gupta, P., Wang, K., Jena, C., Zhang, Y., Lu, Z. and Streets, D. G.: Using gap-filled MAIAC AOD and WRF-Chem to estimate daily PM 2.5 concentrations at 1 km resolution in the Eastern United States, *Atmos. Environ.,* 199, 443–452, doi:10.1016/j.atmosenv.2018.11.049, **2019.**
22. Ring, A. M., Canty, T. P., Anderson, D. C., Vinciguerra, T. P., He, H., **Goldberg, D. L.,** Ehrman, S. H., Dickerson, R. R. and Salawitch, R. J.: Evaluating commercial marine emissions and their role in air quality policy using observations and the CMAQ model, *Atmos. Environ.,* 173(June 2017), 96–107, doi:10.1016/j.atmosenv.2017.10.037, **2018.**
23. **Goldberg, D. L.,** Lamsal, L. N., Loughner, C. P., Swartz, W. H., Lu, Z. and Streets, D. G.: A high-resolution and observationally constrained OMI NO_2 satellite retrieval, *Atmos. Chem. Phys.,* 17(18), 11403–11421, doi:10.5194/acp-17-11403-2017, **2017.**

24. Ren, X., Luke, W. T., Kelley, P., Cohen, M. D., Artz, R., Olson, M. L., Schmeltz, D., Puchalski, M., **Goldberg, D. L.,** Ring, A., Mazzuca, G. M., Cummings, K. A., Wojdan, L., Preaux, S. and Stehr, J. W.: Atmospheric mercury measurements at a suburban site in the Mid-Atlantic United States: Inter-annual, seasonal and diurnal variations and source-receptor relationships, *Atmos. Environ.,* 146, 141–152, doi:10.1016/j.atmosenv.2016.08.028, **2016.**
25. **Goldberg, D. L.,** Vinciguerra, T. P., Anderson, D. C., Hembeck, L., Canty, T. P., Ehrman, S. H., Martins, D. K., Stauffer, R. M., Thompson, A. M., Salawitch, R. J. and Dickerson, R. R.: CAMx ozone source attribution in the eastern United States using guidance from observations during DISCOVER-AQ Maryland, *Geophys. Res. Lett.,* 43(5), 2249–2258, doi:10.1002/2015GL067332, **2016.**
26. **Goldberg, D. L.,** Vinciguerra, T. P., Hosley, K. M., Loughner, C. P., Canty, T. P., Salawitch, R. J. and Dickerson, R. R.: Evidence for an increase in the ozone photochemical lifetime in the eastern United States using a regional air quality model, *J. Geophys. Res. Atmos.,* 120(24), 12778–12793, doi:10.1002/2015JD023930, **2015.**
27. Canty, T. P., Hembeck, L., Vinciguerra, T. P., Anderson, D. C., **Goldberg, D. L.,** Carpenter, S. F., Allen, D. J., Loughner, C. P., Salawitch, R. J. and Dickerson, R. R.: Ozone and NOx chemistry in the eastern US: Evaluation of CMAQ/CB05 with satellite (OMI) data, *Atmos. Chem. Phys.,* 15(19), 10965–10982, doi:10.5194/acp-15-10965-2015, 2015.
28. Stauffer, R. M., Thompson, A. M., Martins, D. K., Clark, R. D., **Goldberg, D. L.,** Loughner, C. P., Delgado, R., Dickerson, R. R., Stehr, J. W. and Tzortziou, M. A.: Bay breeze influence on surface ozone at Edgewood, MD during July 2011, *J. Atmos. Chem.,* 72(3–4), 335–353, doi:10.1007/s10874-012-9241-6, **2015.**
29. **Goldberg, D. L.,** Loughner, C. P., Tzortziou, M., Stehr, J. W., Pickering, K. E., Marufu, L. T. and Dickerson, R. R.: Higher surface ozone concentrations over the Chesapeake Bay than over the adjacent land: Observations and models from the DISCOVER-AQ and CBODAQ campaigns, *Atmos. Environ.,* 84, 9–19, doi:10.1016/j.atmosenv.2013.11.008, **2014.**
30. Loughner, C. P., Tzortziou, M., Follette-Cook, M., Pickering, K. E., **Goldberg, D. L.,** Satam, C., Weinheimer, A., Crawford, J. H., Knapp, D. J., Montzka, D. D., Diskin, G. S. and Dickerson, R. R.: Impact of bay-breeze circulations on surface air quality and boundary layer export, *J. Appl. Meteorol. Climatol.,* 53(7), 1697–1713, doi:10.1175/JAMC-D-13-0323.1, **2014.**

Manuscripts Under Review

1. Kerr, G. H., **Goldberg, D. L.,** Anenberg, S. C., ... : Diesel passenger vehicle market shares influenced COVID-19 changes in nitrogen dioxide pollution in global cities

Manuscripts In Preparation

1. **Goldberg, D. L.,** M. Harkey, J. Johnson, G. Yarwood, S. C. Anenberg, T. A. Holloway: Evaluating the NOx emissions and ozone production sensitivities in Texas using TROPOMI NO_2 and HCHO
2. Bechle, M., ..., **Goldberg, D.L.,** Zhang, Y., Bell, M., Marshall, J. D.: Intercomparison of national $PM_{2.5}$ exposure models.

Competitive Grants Selected for Funding

1. "Value of GeoXO atmospheric composition data for estimating air pollution-related health impacts", NOAA, August 2021 – July 2022, $200,000, *Co-Investigator* (PI: Susan Anenberg, George Washington University)
2. "Using satellite NO_2 observations for public health surveillance and environmental policy planning at global, national, and urban scales", NASA HAQAST, December 2020 – November 2024, $500,000, *Co-Investigator* (PI: Susan Anenberg, George Washington University)
3. "Inconsistent effects of social distancing on air quality in global cities: lessons for protecting near-term public health and designing longer-term urban transportation policies", NASA Rapid Response, June 2020 – May 2021, $100,000, *Co-Principal Investigator* (Co-PI: Susan Anenberg, George Washington University)
4. "Updating the Wisconsin Horizontal Interpolation Program for Satellites (WHIPS)", Texas Commission on Environmental Quality Research Program, June 2020 – November 2021, *Co-Investigator* (PI: Tracey Holloway, University of Wisconsin)
5. "Integrating satellites, ground monitoring, and modeling to estimate long-term NO_2 exposures and associated pediatric asthma impacts", Health Effects Institute, November 2019 – November 2021, $120,000, *Co-Investigator* (PI: Susan Anenberg, George Washington University)
6. "The Changing Atmosphere in North America for 2000 – 2020: High-resolution modeling and satellite analysis", NASA ACMAP, May 2019 – April 2022, $300,000, *Co-Investigator* (PI: Greg Carmichael, University of Iowa)
7. "Taking OMI NO_2 to the next level: Inferring global fossil fuel CO_2 emissions using OMI NO_2 Data Improved with Critical Algorithm Updates", NASA ACMAP, June 2017 – May 2020, $225,000, *Co-Investigator* (PI: Nickolay Krotkov, NASA Goddard)

Pending Grants

1. "Structural Racism: Assessing and Addressing Community Exposures to Environmental Contaminants", Submitted August 2021, Pending, *Co-Investigator* (co-PIs: Susan Anenberg, George Washington University and Sacoby Wilson, University of Maryland)
2. "From space to the street: Using satellite remote sensing to address environmental injustice from transportation-related air pollution", Submitted June 2021, Pending, *Co-Investigator* (PI: Susan Anenberg, George Washington University)

Competitive Grants Not Selected for Funding

1. "A comparative study of atmospheric impacts due to changes in anthropogenic activity during the COVID-19 pandemic in the greater Chicago and New York City regions", Submitted November 2020, Pending, *Co-Principal Investigator* (co-PIs Greg Carmichael and Charles Stanier, University of Iowa)
2. "Developing a near-real-time satellite-based framework to estimate urban NOX emissions in preparation for the TEMPO satellite mission: Using TROPOMI and model simulations as test-beds", Submitted September 2020, Not Selected, *Principal Investigator*

3. "Using Satellites to Monitor Energy Usage and Inform Responses to Disasters", Submitted June 2020, Not Selected, *Co-Investigator* (PI: Jason West, University of North Carolina)
4. "Application of Remote Sensing Tools to Verify, Validate, and Improve Emissions of NO_2 and SO_2 for Texas Air Quality Modeling", Submitted January 2020, Not Selected, *Co-Investigator* (PI: Nathan Pavlovic, Sonoma Technology)
5. "Preparing for TEMPO: Considering future applications of the $HCHO/NO_2$ ratio using lessons learned from OMI and TROPOMI", NASA Aura Science Team, Submitted Sept 2019, Not Selected, *Principal Investigator*
6. "Assessing tropospheric ozone pollution and precursors in African cities using OMI", NASA Aura Science Team, Submitted Sept 2019, Not Selected, *Co-Investigator* (PI: Susanne Bauer, NASA GSFC)
7. "Quantification of Air Pollution from Natural Gas Development and Relationship to Health Outcomes: A Quasi-Experimental Investigation", Submitted Sept 2018 & Sept 2019, *Co-Investigator* (PI: Charlotte Ward, Dartmouth College)
8. "Coupled Energy-Air Quality-Health System: A Data-Driven Decision Tool for Cost-Benefit Assessment", NASA Applied Sciences, Submitted Nov 2017, Not Selected, *Co-Investigator* (PI: Yang Zhang, North Carolina State University)

Media Interactions

1. NASA Earth Observatory, October 28, 2021, Scientific Questions Arrive in Ports, https://earthobservatory.nasa.gov/images/149004/scientific-questions-arrive-in-ports
2. NBC Connecticut, July 26, 2021, A Look at How Western Wildfire Smoke Makes Its Way to Connecticut, http://nbcct.co/Czz0Ari
3. New York Times, April 15, 2021, Subject Matter Expert for Freelance Journalist Lisa Collins, https://www.linkedin.com/in/lisa-m-collins-3162815/
4. Washington Post, June 16, 2020, Commentary in, "Washington has yet to see unhealthful pollution levels this year. That's a record", https://www.washingtonpost.com/weather/2020/06/16/washington-dc-record-low-pollution/
5. WAMU 88.5, NPR Radio, May 19, 2020, Subject Matter Expert for The Kojo Nnamdi Show, https://thekojonnamdishow.org/audio/#/shows/2020-05-19/reducing-air-pollution-during-the-pandemic/116753/@00:00
6. Washington Post, April 22, 2020, Commentary in, "Washington has its cleanest spring air in 25 years: How air quality has improved during the coronavirus crisis", https://www.washingtonpost.com/weather/2020/04/22/washington-dc-air-quality-coronavirus/
7. Nature, April 10, 2020, Commentary in, "Why pollution is plummeting in some cities — but not others", https://www.nature.com/articles/d41586-020-01049-6 doi: 10.1038/d41586-020-01049-6
8. New York Times, April 3, 2020, Subject Matter Expert for Visual Investigations Journalist Christoph Koettl, https://www.nytimes.com/by/christoph-koettl

9. WTOP Radio, April 1, 2020, Commentary in, "Despite telework, stay-at-home orders, not much change to air quality in DC area", https://wtop.com/local/2020/04/despite-telework-stay-at-home-orders-not-much-change-to-air-quality-in-dc-area/
10. Science Magazine, February 12, 2020, Commentary in, "Deadly air pollution is blowing into your state from a surprisingly large source", https://www.sciencemag.org/news/2020/02/deadly-air-pollution-blowing-your-state-surprisingly-large-source
11. Washington Post, February 3, 2020, Commentary in, "Why a toxic brown haze loomed over the Capitol on Monday", https://www.washingtonpost.com/weather/2020/02/03/how-toxic-brown-haze-loomed-over-capitol-monday/
12. Washington Post, July 5, 2019, Commentary in, "Lost in a wall of smoke: Why so many people couldn't see Washington's Fourth of July fireworks", https://www.washingtonpost.com/weather/2019/07/05/lost-wall-smoke-why-so-many-people-couldnt-see-washingtons-july-th-fireworks/
13. Washington Post, February 4, 2019, Commentary in, "There's an air quality alert in Washington, the sky is hazy and it's February. What's going on?", https://www.washingtonpost.com/weather/2019/02/04/theres-an-air-quality-alert-washington-sky-is-hazy-its-february-whats-going/
14. Washington Post, July 10, 2018, Commentary in, "Washington posted first Code Red day since 2012 on Monday due to 'unhealthy' pollution levels", https://www.washingtonpost.com/news/capital-weather-gang/wp/2018/07/10/washington-posted-first-code-red-day-since-2012-monday-due-to-unhealthy-pollution-levels/

First-Author Oral Presentations

1. **Goldberg, D. L.**, S. C. Anenberg, D. Griffin, C. A. McLinden, Z. Lu, D. Streets, (February 2022). Elucidating the "new normal" of NOx emissions in urban areas. Presented at Boston University. *Invited*
2. **Goldberg, D. L.**, S. C. Anenberg, A. Fiore, T. Holloway, T. Russell, J. Kaiser, D. Tong, (January 2022). Using NO2 satellite data for urban planning. Presented at the Health and Air Quality Applied Sciences Team (HAQAST) January 2022 Update Meeting.
3. **Goldberg, D. L.**, G. H. Kerr, (January 2022). Using NO2 satellite data for urban environmental justice applications and lessons learned during the COVID-19 lockdowns. Presented at the New York State BAQAR/NYSERDA Seminar. *Invited*
4. **Goldberg, D. L.**, S. C. Anenberg, Z. Lu, L. N. Lamsal, E. E. McDuffie, S. Smith, D. G. Streets, (December 2021). Reconciling differences between satellite-inferred NOx emissions and inventories in global cities. Presented at the American Geophysical Union (AGU) Fall Meeting.
5. **Goldberg, D. L.**, S. C. Anenberg, Z. Lu, L. N. Lamsal, E. E. McDuffie, S. Smith, D. G. Streets, (December 2021). Estimating NOx emissions from cities using satellite data.

Presented at the Western States Air Resources (WESTAR) Council Annual Meeting. *Invited*

6. **Goldberg, D. L.**, S. C. Anenberg, Z. Lu, L. N. Lamsal, E. E. McDuffie, S. Smith, D. G. Streets, (September 2021). Satellite-derived NOx emissions for 80 global megacities between 2005 and 2019. Presented at the International Global Atmospheric Chemistry (IGAC) Biannual Meeting. Virtually.
7. **Goldberg, D. L.**, S. C. Anenberg, D. Griffin, C. A. McLinden, Z. Lu, D. Streets, (April 2021). Estimating NOx emissions from global cities using satellite data. Presented at the National Centers for Atmospheric Research (NCAR) Atmospheric Chemistry Observation & Modeling (ACOM) Weekly Seminar. Virtually. *Invited*
8. **Goldberg, D. L.**, S. C. Anenberg, G. Kerr, (March 2021). Changes in NO_2 following the COVID-19 lockdowns: Disentangling anthropogenic changes from natural variability. Presented at the Mid-Atlantic Regional Air Management Association (MARAMA) Mobile Sources Workshop. Virtually. *Invited*
9. **Goldberg, D. L.**, S. C. Anenberg, Z. Lu, D. Streets, (January 2021). Top-down NOx emissions estimates for 50 global cities during the last 15 years. Presented at the American Meteorological Society Annual Meeting. Virtually.
10. **Goldberg, D. L.**, S. C. Anenberg, D. Griffin, C. A. McLinden, Z. Lu, D. Streets, (December 2020). Using TROPOMI and re-analysis meteorology to disentangle the impact of the COVID-19 lockdowns on urban NO_2 natural variability. Presented at the American Geophysical Union (AGU) Fall Meeting. Virtually. *Invited*
11. **Goldberg, D. L.**, S. C. Anenberg, G. Kerr, (December 2020). Changes in NO_2 following the COVID-19 lockdowns: Disentangling anthropogenic changes from natural variability. Presented at the Mid-Atlantic Regional Air Management Association (MARAMA) Science Team Meeting. Virtually. *Invited*
12. **Goldberg, D. L.**, S. C. Anenberg, G. Kerr, (November 2020). Health impacts of NO_2 and its changes during the COVID-19 lockdowns. Co-presentation at the Ozone Transport Commission Annual Meeting. Virtually. *Invited*
13. **Goldberg, D. L.**, S. C. Anenberg, D. Griffin, C. A. McLinden, Z. Lu, D. Streets, (October 2020). Oversampling TROPOMI NO_2 in the US & using it to estimate effects of COVID-19 lockdowns on urban NOx emissions. Presented at the OMI-TROPOMI Science Team Meeting. Virtually.
14. **Goldberg, D. L.**, S. C. Anenberg, D. Griffin, C. A. McLinden, A. Mohegh, Z. Lu, D. Streets, (October 2020). Disentangling the impact of the COVID-19 lockdowns on urban NO_2 from natural variability. Presented at the 19th Annual Community Modeling and Analysis System (CMAS) Conference. Virtually.
15. **Goldberg, D. L.**, S. C. Anenberg, G. Kerr, (September 2020). Health impacts of NO_2 and its changes during the COVID-19 lockdowns. Co-presentation at the NCAR Climate and Health Seminar Series. Virtually. *Invited*
16. **Goldberg, D. L.**, Z. Lu, D. Streets, S. C. Anenberg, A. Mohegh, L. N. Lamsal, N. A. Krotkov, B. N. Duncan, F. Liu, D. Griffin, C. McLinden, H. Eskes (August 2020). The satellite data revolution: How new satellite instruments can provide better estimates of NOx pollution.

Presented at the International Society of Environmental Epidemiology Annual Meeting. Virtually.

17. **Goldberg, D. L.**, Z. Lu, D. Streets, S. C. Anenberg, A. Mohegh, L. N. Lamsal, N. A. Krotkov, B. N. Duncan, F. Liu, D. Griffin, C. McLinden, H. Eskes (June 2020). Estimating air pollution emissions, exposures, and public health impacts in cities worldwide. Presented at the TOLNET and Pandora Science Team Meeting. Virtually.
18. **Goldberg, D. L.**, Z. Lu, D. Streets, S. C. Anenberg, A. Mohegh, T. Canty, R. J. Salawitch, R. R. Dickerson (February 2020) Using models and satellite data to estimate air pollution in the Baltimore-Washington area. Presented at The Baltimore-Washington Regional Air Quality Symposium. College Park, MD. *Invited*
19. **Goldberg, D. L.**, Z. Lu, D. G. Streets, A. Mohegh, V. Southerland, S. C. Anenberg (January 2020) Using satellite data to estimate air pollution at high spatiotemporal resolution. Presented at The Applications for Big Data and the Environment. Davis, CA. *Invited*
20. **Goldberg, D. L.**, Z. Lu, D. Streets, S. C. Anenberg, A. Mohegh, V. Southerland, L. N. Lamsal, N. A. Krotkov, B. N. Duncan, F. Liu, D. Griffin, C. McLinden, H. Eskes (January 2020). Estimating air pollution emissions, exposures, and public health impacts in cities worldwide. Presented at the American Meteorological Society Annual Meeting, Boston, MA.
21. **Goldberg, D. L.**, Z. Lu, D. G. Streets, B. de Foy, L. N. Lamsal, N. A. Krotkov, B. N. Duncan, F. Liu, D. Griffin, C. McLinden, P. Achakulwisut, A. Mohegh, V. Southerland, S. C. Anenberg (December 2019). Using NASA satellite data to estimate exposure to air pollution. Presented at the George Washington University Environmental and Occupational Health Seminar. Washington, DC. *Invited*
22. **Goldberg, D. L.**, Z. Lu, D. Streets, S. C. Anenberg, A. Mohegh, V. Southerland, L. N. Lamsal, N. A. Krotkov, B. N. Duncan, F. Liu, D. Griffin, C. McLinden, H. Eskes (October 2019). Estimating air pollution emissions, exposures, and public health impacts in cities worldwide. Presented at the New Applications in the Use of Satellite Data Monitoring for Population Health. Huntsville, AL.
23. **Goldberg, D. L.**, Z. Lu, T. Oda, L. N. Lamsal, N. A. Krotkov, B. N. Duncan, F. Liu, D. Griffin, C. McLinden, D. G. Streets (August 2019). Using OMI NO_2 to infer fossil-fuel emissions of CO_2 from large metropolitan areas in the United States. Presented at the Aura Science Team Meeting. Pasadena, CA.
24. **Goldberg, D. L.**, Z. Lu, D. G. Streets, B. de Foy, L. N. Lamsal, N. A. Krotkov, B. N. Duncan, F. Liu, D. Griffin, C. McLinden, P. Achakulwisut, A. Mohegh, V. Southerland, S. C. Anenberg (July 2019). Policy-relevant applications of satellite data: Estimating air pollution emissions, exposures, and public health impacts in cities worldwide. Presented at the Health and Air Quality Applied Sciences Team (HAQAST6) Meeting. Pasadena, CA.
25. **Goldberg, D. L.**, Z. Lu, B. de Foy, D. G. Streets (May 2019). Investigating NO_X emissions from megacities using re-processed OMI NO_2 and TROPOMI NO_2. Presented at the OWLETS Science Team Meeting. College Park, MD.
26. **Goldberg, D. L.**, Z. Lu, D. G. Streets, (March 2019) Using satellite data to estimate air pollution at high spatiotemporal resolution. Presented at The Workshop in Environmental Economics and Data Science (TWEEDS). Portland, OR. *Invited*

27. **Goldberg, D. L.**, L. N. Lamsal, P. Saide, G. Carmichael, B. de Foy, D. Henze, Z. Lu, D. G. Streets (December 2018). Recent Advances in Deriving NOx Emission Estimates from Satellite Data. Presented at the American Geophysical Union (AGU) Fall Meeting. Washington, D.C.
28. **Goldberg, D. L.**, Z. Adelman, D. Kenski, M. Janssen, T. Nergui, Z. Lu (December 2018). Linking Surface Monitors, Satellite Data, and Emissions Inventories to Investigate Regional Haze Trends in the Eastern U.S. Presented at the American Geophysical Union (AGU) Fall Meeting. Washington, D.C.
29. **Goldberg, D. L.**, P. Gupta, K. Wang, C. Jena, Y. Zhang, Z. Lu, D. G. Streets (October 2018). Using MAIAC AOD and WRF-Chem to estimate daily PM2.5 concentrations at 1 km resolution in the eastern United States. Presented at the 17th Annual Community Modeling and Analysis System (CMAS) Conference. Chapel Hill, NC.
30. **Goldberg, D. L.**, L. N. Lamsal, P. Saide, G. Carmichael, Z. Lu, D. G. Streets (August 2018) A top-down assessment using OMI NO_2 suggests an underestimate in the NO_x emissions inventory in Seoul, Korea during KORUS-AQ. Presented at the KORUS-AQ Science Team Meeting. Irvine, CA.
31. **Goldberg, D. L.**, L. N. Lamsal, C. P. Loughner, W. H. Swartz, P. Saide, G. Carmichael, D. Henze, Z. Lu, D. G. Streets (July 2018). Recent advances in estimating NO_x emissions from OMI. Presented at the Health and Air Quality Applied Sciences Team (HAQAST4) Meeting. Madison, WI.
32. **Goldberg, D. L.**, L. N. Lamsal, C. P. Loughner, W. H. Swartz, P. Saide, G. Carmichael, D. Henze, Z. Lu, D. G. Streets (December 2017). Estimating NO_x emissions and surface concentrations at high spatial resolution. Presented at the American Geophysical Union (AGU) Fall Meeting. New Orleans, LA.
33. **Goldberg, D. L.**, L. N. Lamsal, C. P. Loughner, W. H. Swartz, P. Saide, G. Carmichael, D. Henze, Z. Lu, D. G. Streets (November 2017). Estimating NO_x emissions and surface concentrations at high spatial resolution. Presented at the Health and Air Quality Applied Sciences Team (HAQAST3) Meeting. Palisades, NY.
34. **Goldberg, D. L.**, L. N. Lamsal, C.P. Loughner, Z. Lu, D. G. Streets, T. P. Canty, T.P. Vinciguerra, D. C. Anderson, R. J. Salawitch & R. R. Dickerson (October 2017) Ground measurements, satellite observations, and model simulations of air quality in the Chesapeake Bay region. Presented at the OWLETS Science Team Meeting. Baltimore, MD. *Invited*
35. **Goldberg, D. L.**, L. N. Lamsal, C.P. Loughner, P. Saide, G. Carmichael, Z. Lu, D. G. Streets, (September 2017) A new satellite technique to derive high-resolution tropospheric NO_2 columns in the eastern United State. Presented at the OMI Science Team Meeting. Greenbelt, MD. *Invited*
36. **Goldberg, D. L.**, L. N. Lamsal, C.P. Loughner, Z. Lu, D. G. Streets, T. P. Canty, T.P. Vinciguerra, D. C. Anderson, R. J. Salawitch & R. R. Dickerson (August 2017) Innovative techniques to observe and model air pollution in the eastern United States. Presented at Northwestern University. Evanston, IL. *Invited*
37. **Goldberg, D. L.**, L. N. Lamsal, C.P. Loughner, Z. Lu, D. G. Streets, T. P. Canty, T.P. Vinciguerra, D. C. Anderson, R. J. Salawitch & R. R. Dickerson (June 2017) Innovative

techniques to observe and model air pollution in the eastern United States. Presented at the University of Wisconsin-Madison. Madison, WI. *Invited*

38. **Goldberg, D. L.**, L. N. Lamsal, P. Saide, G. Carmichael, Z. Lu, D. G. Streets (February 2017) Validation of a satellite technique to derive high-resolution tropospheric NO_2 columns in Korea. Presented at the KORUS-AQ Science Team Meeting. Seogwipo, Jeju, South Korea.
39. **Goldberg, D. L.**, C. P. Loughner, L. N. Lamsal, Z. Lu, D. G. Streets (October 2016). High-resolution OMI satellite retrievals of tropospheric NO_2 in the eastern United States. Presented at the 15th Annual Community Modeling and Analysis System (CMAS) Conference. Chapel Hill, NC.
40. **Goldberg, D. L.**, T. P. Canty, T.P. Vinciguerra, C.P. Loughner, D. C. Anderson, R. J. Salawitch & R. R. Dickerson (February 2016) Lifetime and distribution of ozone air pollution in the eastern United States. Presented at Carnegie Mellon University. Pittsburgh, PA. *Invited*
41. **Goldberg, D. L.**, T. P. Canty, L. Hembeck, T. P. Vinciguerra, R. J. Salawitch & R. R. Dickerson. (October 2015). Evidence for an increasing geographic region of influence on ozone air pollution in the eastern United States. Presented at the 14th Annual Community Modeling and Analysis System (CMAS) Conference. Chapel Hill, NC.
42. **Goldberg, D. L.**, T. P. Canty, T. P. Vinciguerra, H. He, R. J. Salawitch & R. R. Dickerson. (July 2015). Recent ozone modeling results in the Mid-Atlantic. Presented at the Mid-Atlantic Regional Air Management Association (MARAMA) Science Team Meeting. Richmond, VA.
43. **Goldberg, D. L.**, T. P. Canty, L. Hembeck, C. P. Loughner, D. C. Anderson, R. J. Salawitch & R. R. Dickerson. (June 2015). Evidence for an increasing geographic region of influence on ozone air pollution in the Eastern United States. Presented at the NASA Air Quality Applied Sciences Team (AQAST) Summer 2015 Meeting. St Louis, MO.
44. **Goldberg, D. L.**, T. P. Canty, T. P. Vinciguerra, H. He, R. J. Salawitch & R. R. Dickerson. (April 2015). Scientific insight from CAMx OSAT modeling. Presented at the Ozone Transport Commission (OTC) Spring Meeting. Washington, DC.
45. **Goldberg, D. L.**, C. P. Loughner, M. A. Tzortziou, J. W. Stehr, K. E. Pickering & R. R. Dickerson. (January 2015). The Impact of the Chesapeake Bay Climate and Boundary Layer Dynamics on Air Pollutant Concentrations during Smog Episodes. Presented at the American Meteorological Society (AMS) 2015 Annual Meeting. Phoenix, AZ.
46. **Goldberg, D. L.**, T. P. Canty, C. P. Loughner, L. Hembeck, D. C. Anderson, T. P. Vinciguerra, R. J. Salawitch, R. R. Dickerson. (October 2014) Recent Improvements in Regional Air Quality Models and their Impacts on Ozone Source Attribution. Presented at the 13th Annual Community Modeling and Analysis System (CMAS) Conference. Chapel Hill, NC.
47. **Goldberg, D. L.**, C. P. Loughner, M. A. Tzortziou, J. W. Stehr, K. E. Pickering, & R. R. Dickerson. (October 2014). Increased Air Pollution over the Chesapeake Bay and its Effect on Deposition to the Bay. Presented at the NADP 2014 Fall Meeting. Indy, IN.
48. **Goldberg, D. L.**, C. P. Loughner, M. A. Tzortziou, L. T. Marufu, J. W. Stehr, K. E. Pickering & R. R. Dickerson. (February 2014). Higher surface ozone concentrations over the

Chesapeake Bay than over adjacent land: Observations and models from DISCOVER-AQ. Presented at the Winter 2014 DISCOVER-AQ Science Team Meeting. Newport News, VA.

Conference Poster Presentations

1. **Goldberg, D. L.**, Z. Lu, D. G. Strets, B. de Foy, D. Griffin, C. McLinden, B. N. Duncan, N. A. Krotkov, Lok N. Lamsal, F. Liu, M. O. Nawaz, D. Henze, M.A. Mohegh, S. C. Anenberg (December 2019). High-resolution NO_2 exposure estimates and top-down NO_x emissions using OMI NO_2 and TROPOMI NO_2. Presented at the American Geophysical Fall Meeting. San Francisco, CA.
2. **Goldberg, D. L.**, P. Gupta, K. Wang, Y. Zhang, Z. Lu, D. G. Streets (June 2019). Using MAIAC AOD to estimate daily PM2.5 and its long-term trends (2008 – 2018) at 1 km resolution in the Eastern United States. Presented at the EPA Air Climate & Energy (ACE) Centers Annual Meeting. Pittsburgh, PA.
3. **Goldberg, D. L.**, P. Gupta, K. Wang, Y. Zhang, Z. Lu, D. G. Streets (May 2019). Using MAIAC AOD to estimate daily PM2.5 and its long-term trends (2008 – 2018) at 1 km resolution in the Eastern United States. Presented at the OWLETS Science Team Meeting. College Park, MD.
4. **Goldberg, D. L.**, L. N. Lamsal, C. P. Loughner, W. H. Swartz, P. Saide, G. Carmichael, D. Henze, Z. Lu, D. G. Streets (July 2018). Using MODIS AOD and WRF-Chem to infer daily PM2.5 concentrations at 1 km resolution in the eastern United States. Presented at the Health and Air Quality Applied Sciences Team Bi-annual Meeting. Madison, WI.
5. **Goldberg, D. L.**, Z. Lu, L. N. Lamsal, C. P. Loughner, R. C. Levy, P. Gupta, Y. Zhang, D. G. Streets. (December 2016). High resolution satellite retrievals of NO_2 and Aerosol Optical Depth for health impact studies. Presented at the American Geophysical Union (AGU) Fall 2016 Meeting. San Francisco, CA.
6. **Goldberg, D. L.**, T. P. Vinciguerra, L. Hembeck, D. C. Anderson, T. P. Canty, R. J. Salawitch & R. R. Dickerson. (January 2016). CAMx Ozone Source Attribution in the Eastern United Sates using Guidance from Observations during DISCOVER-AQ Maryland. Presented at the NASA Air Quality Applied Sciences Team (AQAST) Winter 2016 Meeting. RTP, NC.
7. **Goldberg, D. L.**, T. P. Vinciguerra, L. Hembeck, D. C. Anderson, S. Carpenter, T. P. Canty, R. J. Salawitch & R. R. Dickerson. (December 2014). Using Source Apportionment to Evaluate the Cross State Transport of Ozone in the Eastern United States. Presented at the American Geophysical Union (AGU) Fall 2014 Meeting. San Francisco, CA.
8. **Goldberg, D. L.**, T. P. Vinciguerra, L. Hembeck, D. C. Anderson, S. Carpenter, T. P. Canty, R. J. Salawitch & R. R. Dickerson. (June 2014). Using CAMx and CMAQ to Investigate Cross-state Transport of Ozone in the Eastern United States. Presented at the NASA Air Quality Applied Sciences Team (AQAST) Summer 2014 Meeting. Boston, MA.
9. **Goldberg, D. L.**, T. P. Vinciguerra, L. Hembeck, D. C. Anderson, T. P. Canty, R. J. Salawitch & R. R. Dickerson. (December 2013). CAMx and CMAQ Model Intercomparison for July 2007 in the Baltimore-Washington Metropolitan Region. Presented at the American Geophysical Union (AGU) Fall 2013 Meeting. San Francisco, CA.

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EDUCATION

2011	Ph.D. Environmental Science and Engineering, Environmental Policy, University of North Carolina Gillings School of Global Public Health.
2008	M.S. Environmental Science and Engineering, University of North Carolina.
2004	B.A. Biology, Environmental Science, Northwestern University.

PROFESSIONAL EXPERIENCE

2016 -	Associate Professor of Environmental and Occupational Health and of Global Health, George Washington University (2017 – current, with tenure 2021). Director of the GW Climate and Health Institute (2021 – current). Director of the MPH in Global Environmental Health (2017 – current). Co-designer of the MPH in Climate and Health (2020 – current). Professorial Lecturer in Environmental and Occupational Health (2016 – 2017).
2016 - 2020	Co-Founder and Principal, Environmental Health Analytics, LLC.
2014 - 2016	Deputy Managing Director for Recommendations, U.S. Chemical Safety Board.
2010 - 2014	Environmental Protection Specialist, U.S. Environmental Protection Agency.
2012 - 2013	Senior Advisor for U.S. Cookstoves Initiatives, U.S. Department of State.
2009	Science and Technology Policy Fellow, National Academy of Sciences.
2004 - 2006	Recommendations Specialist, U.S. Chemical Safety Board.

HONORS

2020	Science and Technology Achievement Award, Level II, U.S. EPA.
2020	Arthur C. Stern Distinguished Paper Award for 2015 paper in *Journal of the Air & Waste Management Association*
2019	Reviewer of the Year 2018, *Environmental Research Letters*.
2018	Global asthma burden paper in *Environmental Health Perspectives* ranked in 99th percentile for online attention.
2018	Award for Outstanding Publication in the *Journal of Environmental and Resource Economics*.
2018	Exceptional Support to ORD Award, Multidisciplinary OAR and OGC Support for ISA Program, U.S. EPA.
2018	GW Research Days Sustainability Prize for Best Graduate Student poster (w/ [redacted]
2018	Editor's Citation for Excellence in Refereeing for *GeoHealth*.
2017	*Nature* diesel NOx article ranked in 99th percentile for online attention.
2016	Nominated to Climate and Clean Air Coalition Roster of Experts.
2015	Science and Technology Achievement Award, Level I, U.S. EPA.

2014	Science and Technology Achievement Award, Level II, U.S. EPA.
2014	Special Accomplishment Recognition Award, U.S. EPA.
2014	Director's Award for Leadership and Collaboration, U.S. EPA.
2013	Best Feature article in *Environmental Science and Technology.*
2012	Article featured in *Environmental Health Perspectives* Science Selections.
2010 - 2011	Presidential Management Fellowship, U.S. EPA.
2011	Special Act Award for Leadership and Collaboration, U.S. EPA.
2011	Academic Excellence Award, Delta Omega Honorary Society in Public Health.
2011	Harvard University Center for the Environment Fellowship (declined, 2011).
2010	Outstanding Student Paper Award, American Geophysical Union 2010 Fall Meeting.
2010	Elected to Sigma Xi.
2009	School-wide Student Travel Award, UNC School of Public Health.
2009	Student Achievement Award, UNC Environmental Science and Engineering.
2008	First place, student poster competition, 40th Annual Air Pollution Workshop.
2007 - 2008	Graduate Student Fellowship, UNC Institute for the Environment.

CONTRACTS AND GRANTS

Total costs are shown (portion managed by Anenberg in parentheses, if different from total)

Current

1. "Value of GeoXO atmospheric composition data for estimating air pollution-related health impacts", NOAA August 1, 2021 – July 31, 2022, PI: Susan Anenberg, $199,416.

2. "Using satellite NO2 observations for public health surveillance and environmental policy planning at global, national, and urban scales", NASA January 25, 2021 – January 24, 2025, PI: Susan Anenberg, $756,993.

3. "Data-driven forecasts of hazardous air quality events over North America", NASA January 25, 2021 – January 24, 2025, PI: Daniel Tong (Anenberg is Co-Investigator), $499,000 ($145,691).

4. "Advancing GW cross-disciplinary collaboration in climate change and public health research" George Washington University Cross-Disciplinary Research Fund, July 1, 2020 – June 30, 2022, PI: Susan Anenberg, $49,895.

5. "Integrating satellites, ground monitoring, and modeling to estimate long-term NO2 exposures and pediatric asthma impacts" Health Effects Institute, February 1, 2020 - January 31, 2022, PI: Susan Anenberg, $125,000.

6. "ACRoBEAR Arctic Community Resilience to Boreal Environmental change: Assessing Risks from fire and disease" Belmont Forum, January 1, 2020 – December 31, 2023, PI: Stephen Arnold (Anenberg is Co-Investigator), $2,182,800 ($20,000).

7. "Methods and tools to integrate air quality and health into urban climate action planning" Wellcome Trust, November 1, 2019 – October 31, 2022, PI: Susan Anenberg, $645,611.

8. "Using remote sensing and Earth system models to improve air quality and public health in megacities" NASA Award No. 80NSSC19K0193, September 1, 2018 – August 31, 2022, PI: Susan Anenberg, $1,179,040.

Completed

1. "Inconsistent effects of social distancing on air quality in global cities: lessons for protecting near-term public health and designing longer-term urban transportation policies", NASA Rapid Response and Novel Research in Earth Sciences (RRNES)", June 1, 2020 – May 31, 2022, PI: Susan Anenberg, $99,804.

2. "NASA Health and Air Quality Applied Science Team (HAQAST)", NASA Award No. NNX16AQ26G, August 15, 2016 – August 14, 2021, PI: Daven Henze (Anenberg is Co-Investigator), $438,143 ($99,773).

3. "Integrating air quality and health impacts into C40 Climate Action Planning" Children's Investment Fund Foundation/Clean Air Fund grant to C40 Cities, May 1, 2019 – March 31, 2021, PI: Susan Anenberg, $370,000.

4. "Local-scale air pollution health impact assessment" Environmental Defense Fund, January 22, 2019 – December 31, 2020, PI: Susan Anenberg, $147,230.

5. "Air quality and public health in urban climate action planning" George Washington University Milken Institute School of Public Health Pilot Grants Program, September 1, 2018 – August 31, 2020, PI: Susan Anenberg, $49,961.

6. "NASA Health and Air Quality Applied Science Team – Tiger Team 2 Supplement" NASA Award No. NNX16AQ26G, September 1, 2019 – August 31, 2020, Co-Investigator, PI: Daven Henze (Anenberg is Project PI), $65,000 ($65,000).

7. "NASA Health and Air Quality Applied Science Team – Tiger Team 1 Supplement" NASA Award No. NNX16AQ26G, September 1, 2018 – August 31, 2019, PI: Susan Anenberg, $110,000 ($110,000).

8. "Further improving the ability of the BenMAP-CE tool to quantify the impacts to human health of aeroallergens and wildfires" Subcontract to Industrial Economics, EPA Contract EP-D-14-031, March 1, 2018 – September 30, 2019, PI: Susan Anenberg, $76,751.

9. "Expert review to Air Pollutions Solutions document" US Agency for International Development/Social Solutions International, Inc., May 9, 2019 – June 7, 2019, PI: Susan Anenberg, $3,400.

10. "Global burden of disease from transportation-related air pollution" Contract from International Council on Clean Transportation, May 1, 2018 – April 30, 2019, PI: Susan Anenberg, $60,000.

11. "Further improving the ability of the BenMAP-CE tool to quantify the impacts to human health of aeroallergens and wildfires" Subcontract to Industrial Economics, EPA Contract EP-D-14-031, October 1, 2017 – May 31, 2018, PI: Susan Anenberg, $11,470.

12. "Synthesize literature on household air pollution impacts on non-communicable diseases for Bloomberg Household Air Pollution Initiative project" Subcontract to Health Effects Institute on Bloomberg Philanthropies contract, April 17, 2017 – April 15, 2018, PI: Susan Anenberg, $70,000.

13. "NASA Health and Air Quality Applied Science Team (HAQAST) – Tiger Team Supplement", NASA Award No. NNX16AQ26G, August 15, 2017 – August 14, 2018, PI: Daven Henze (Anenberg is Co-Investigator), $100,000 ($10,000).

14. "Estimate air pollution, health, climate, and crop impacts of diesel vehicle NOx emissions and their mitigation in 11 major vehicle markets" Contract from the International Council on Clean Transportation, January 1, 2016 – June 30, 2017, PI: Susan Anenberg, $84,000.

15. "Develop a Gold Standard Methodology to estimate and verify averted disability-adjusted life years (ADALYs) from reduced household air pollution exposure achieved by clean cookstove interventions" Contract from the Gold Standard Foundation, February 1, 2016 - December 31, 2016, PI: Susan Anenberg, $36,625.

16. "Develop a proof-of-concept case study that uses EPA's BenMAP-CE model to quantify and monetize impacts of climate-related changes in aeroallergen levels on respiratory health in the U.S." Subcontractor to Industrial Economics, Inc., EPA Contract EP-D-14-032, July 11, 2016 – September 30, 2017, PI: Susan Anenberg, $28,420.

17. "Review the health, climate, cryosphere, and environmental impacts of residential solid fuel combustion for cooking and heating, and draft white papers to inform the Combined Cooking and Heating/Coalstoves Summit" Subcontractor to International Cryosphere Climate Initiative, sponsored by Climate and Clean Air Coalition, October 1, 2016 – May 31, 2017, PI: Susan Anenberg, $21,500.

18. "Estimate climate and health benefits of clean cookstove programs in Mozambique" Contract from World Bank, Contract No. 7179092, April 22, 2016 – June 30, 2016, PI: Susan Anenberg, $18,750.

19. "Develop and finalize Science and Technical Advisory Panel document intended to assist GEF and implementing agencies incorporate measures that reduce black carbon in climate change mitigation projects and impact to reduce greenhouse gas emissions" Contract from United Nations Environment Programme, Contract No. 25806, November 1, 2014 – April 30, 2015, PI: Susan Anenberg, $25,000.

20. "Develop and finalize publication on general principles for the proper conduct of air pollution health risk assessment" Contract from World Health Organization, Contract No. 201233406, May 15, 2015 – June 15, 2015, PI: Susan Anenberg, $8,000.

21. "Develop a domestic heating component and funding proposal" Contract from the Climate and Clean Air Coalition, April 30, 2015 – September 30, 2015, PI: Susan Anenberg, $10,200.

PUBLICATIONS

Peer-reviewed journal Articles

Name underlined = trainee of Dr. Anenberg; * = Dr. Anenberg is corresponding or senior author

Submitted and in preparation

Johnson, L., P. Krisko, M. Malik, C. O'Donnell, N. Pendleton, D. Ahn, A. Bizberg, Z. Chafe, D. Kim, S. McCormick, S. Naidoo, S.C. **Anenberg***. Environmental, health, and equity co-benefits in urban climate action plans: A descriptive analysis for 27 C40 member cities. Under review.

Kleiman, G., S. **Anenberg**, Z. Chafe, D.C. Appiah, T. Assefa, A. Bizberg, T. Coombes, D. Cuestas, M.I. de Casas, D. Henze, A. Kessler, I. Kheirbek, P. Kinney, M. Mahiatji, J.D. Marshall, S. Naidoo, N. Potwana, A. Rodriguez, C.W. Tessum, C. Thomas. Enhanced integration of health, climate and air quality management planning at the urban-scale. Under review.

Badr, H.S., B.F. Zaitchik, [redacted] N.-L.H. Nguyen, Y.-T. Chen, P. Hinson, J.M. Colson, M.N. Kosek, E. Dong, H. Du, A. Mohegh, D.L. Goldberg, S.C. **Anenberg**, L.M. Gardner (2021) Unified real-time environmental-epidemiological data for multiscale modeling of the COVID-19 pandemic. Under review.

Apte, J.S., S Seraj, S.E. Chambliss, M. Hammer, S.C. **Anenberg**, A. van Donkelaar, R.V. Martin, M. Brauer (2021) Air inequality: Global divergence in urban fine particulate matter. Under review.

von Salzen, K., C.Hl Whaley, S.C. **Anenberg**, R. van Dingenen, Z. Klimont, R. Mahmood, S.R. Arnold, S. Beagley, R.-Y-Chien, J. Christensen, S. Eckhardt, A.M.L. Ekman, N. Evangeliou, G. Faluvegi, M.G. Flanner, J.S. Fu, M. Gauss, W. Gong, J.L. Hjorth, U. Im, S. Krishnan, K. Kupiainen, T. Kuhn, J. Langner, K.S. Law, L. Marelle, D. Olivie, T. Onishi, N. Oshima, A. D.-L. Palomares, V.-V. Paunu, Y. Peng, D. Plummer, L. Pozzoli, S. Rao-Skirbekk, J.-C. Raut, M. Sand, J. Schmale, M. Sigmond, M.A. Thomas, K. Tsigaridis, S.G. Tsyro, S.T. Turnock, M. Wang, B. Winter. Policies to limit air pollution are key for successfully mitigating Arctic warming. Under review.

[redacted], M. Delang, J. Becker, M. Serre, J. West, K.-L. Chang, O. Cooper, S.C. **Anenberg***. Estimates of ozone concentrations and attributable mortality in urban, peri-urban and rural areas worldwide in 2019. Under review.

Tessum, M.W., S.C. **Anenberg**, Z. Chafe, D. Henze, G. Kleiman, I. Kheirbek, J.D. Marshall, C.W. Tessum. Sources of ambient PM2.5 in 96 global cities. Under review.

[redacted], D.L. Goldberg, K.E. Knowland, C.A. Keller, D. Oladini, I. Kheirbek, L. Mahoney, Z. Lu, S.C. **Anenberg***. Diesel passenger vehicle shares influenced COVID-19 changes in urban nitrogen dioxide air pollution. Under review.

Keswani, A., H. Akselrod, S.C. **Anenberg**. Health impacts of air pollution and climate change: What clinicians need to know. Under review. (Invited)

[redacted] B. Ford, J. Burkhardt, S. Magzamen, S. **Anenberg**, J. Bayham, E.V. Fischer, J.R. Pierce. Influence of wildfire smoke on indoor air quality in several western US cities. Under review.

Larkin, A., A. Mohegh, D.L. Goldberg, M. Brauer, S.C. **Anenberg**, P. Hystad. A global spatial-temporal land use regression model for nitrogen dioxide air pollution. In preparation.

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Achakulwisut, P., L. Mickley, S. **Anenberg** (2018) Increased deaths and illnesses from inhaling airborne dust: An understudied impact of climate change. The Conversation, June 11, 2018. Available at https://theconversation.com/increased-deaths-and-illnesses-from-inhaling-airborne-dust-an-understudied-impact-of-climate-change-96625.

Fann, N., A.D. Lamson, S.C. **Anenberg**, B.J. Hubbell (2013) Letter in response to Fraas & Lutter article: "Uncertain benefits estimates for reductions in fine particle concentrations," *Risk Analysis*, 33:755-756.

Anenberg, S.C., J. Moss, J. Jetter, V. Ramanathan (2012) Clean stoves benefit climate and health, *Nature*, 490:343.

Fann, N., A. Lamson, S.C. **Anenberg**, K. Wesson, D. Risley, B.J. Hubbell (2012) Response to Cox letter: "Miscommunicating risk, uncertainty, and causation: Fine particle air pollution and mortality risk as an example", *Risk Analysis*, 32:768-770.

Anenberg, S.C., J.J. West, L.W. Horowitz, D.Q. Tong (2011) The global burden of air pollution on mortality: Anenberg et al. respond, *Environ Health Perspect.* 119(4):A158-A159.

Anenberg, S.C., J.J. West, L.W. Horowitz, D.Q. Tong (2010) The global burden of air pollution on mortality: Anenberg et al. respond, *Environ Health Perspect.* 118(10):A424-A425.

Other Publications

Descari, S. et al. (2019) Alaskan Layered Pollution And Chemical Analysis (ALPACA) White Paper. Available at: https://alpaca.community.uaf.edu/files/2019/05/ALPACA-whitepaper.pdf.

Anenberg, S.C. (2017) Impacts of oak pollen on allergic asthma in the USA and potential effect of future climate change: a modelling analysis, *Lancet Planetary Health Abstracts*.

West, J.J., Y. Zhang, S. Smith, R. Silva, J. Bowden, V. Naik, Y. Li, D. Gilfillan, Z. Adelman, M. Fry, S. **Anenberg**, L. Horowitz, J.-F. Lamarque (2017) Co-benefits of global and domestic greenhouse gas emissions for air quality and human health, *Lancet Planetary Health Abstracts*.

Climate and Clean Air Coalition (2017) Addressing black carbon and other emissions from combined cooking+heating and coal heating stoves, White Paper #4: Solutions – technological, policy, financing. Paris, France. Available at: http://warsawstovesummit.org/.

Climate and Clean Air Coalition (2017) Addressing black carbon and other emissions from combined cooking+heating and coal heating stoves, White Paper #3: Health, climate, and environmental impacts. Paris, France. Available at: http://warsawstovesummit.org/.

Climate and Clean Air Coalition (2017) Addressing black carbon and other emissions from combined cooking+heating and coal heating stoves, White Paper #2: Problem definition – coal heating. Paris, France. Available at: http://warsawstovesummit.org/.

Climate and Clean Air Coalition (2017) Addressing black carbon and other emissions from combined cooking+heating and coal heating stoves, White Paper #1: Problem definition – combined cooking and heating. Paris, France. Available at: http://warsawstovesummit.org/.

Anenberg, S.C. (2017) Estimating air pollution-related health impacts of future changes in wildfire activity. Memo to the U.S. Environmental Protection Agency Office of Air Quality Planning and Standards, Washington, DC.

Anenberg, S.C. (2011) *Using atmospheric models to estimate global air pollution mortality*, Ph.D. Dissertation, University of North Carolina at Chapel Hill, Chapel Hill, NC 27599.

Casper, S. (2008) Using EPA's Environmental Benefits and Mapping Analysis Program (BenMAP) for Global Health Impact Analysis, final report for NNEMS Fellowship, available at http://www.epa.gov/air/benmap/docs/BenMAP_Global.pdf.

Casper, S. (2008) *The global burden of anthropogenic ozone and fine particulate matter on premature human mortality*, M.S. Thesis, University of North Carolina, Chapel Hill, NC 27599.

MEDIA HIGHLIGHTS

2022 BBC Newshour, USA Today, Independent, Chicago Sun-Times, The Hill, Yahoo News, Washington Post, WNYC/Gothamist

2021 WTOP, WAMU/dcist, NASA Earth Observatory, Popular Science, Chemical and Engineering News

2020 CityLab, Scripps channels, WTOP, National Geographic, Washington Post, NPR, Yale Climate Connections

2019 Guardian, US News & World Report, BBC Radio 4, Press Association, Popular Science, Le Monde

2018 Earth.com, Smithsonian Magazine, NASA, Environmental Health News

2017 Guardian, Economic Times, LA Daily News, Scientific American, Jakarta Post, New Scientist

PRESENTATIONS

Conference and Workshop Presentations

*presentation by co-author

1. Johnson, L., S.C. **Anenberg**, G. Kerr, Q. Xiao (2022) Satellite data for environmental justice: Advancing EJ mapping tools and building a new community of practice. National Environmental Justice Conference, March 11, Washington, DC.
2. Malashock, D., S.C. **Anenberg**, M. DeLang, J. Becker, M. Serre, J. West, K.-L. Chang, O. Cooper (2021) Estimates of ozone concentrations and attributable mortality in urban, peri-urban and rural áreas worldwide in 2019. American Geophysical Union Fall Meeting, December 15, New Orleans.
3. Ahn, D., Goldberg, D., T. Oda, S.C. **Anenberg** (2021) Investigating CO2 emissions trends for cities globally: The effectiveness of urban climate actions in reducing greenhouse gas emissions and improving air quality. American Geophysical Union Fall Meeting, December 15, New Orleans.
4. O'dell, K., B. Ford, J. Burkhardt, S.C. **Anenberg**, J. Bayham, E. Fischer, J. Pierce (2021) Influence of wildfire smoke on indoor air quality in several western US cities. American Geophysical Union Fall Meeting, December 15, New Orleans.
5. Nawaz, M., D. Henze, S.C. **Anenberg**, C. Braun, J. Miller (2021) Comparing domestic and extra-regional contributions to pollutant exposures and health imapcts in G20 countries through a novel adjoint modeling approach. American Geophysical Union Fall Meeting, December 15, New Orleans.
6. Kerr, G., D. Goldberg, M. Harris, A. Roy, S.C. **Anenberg** (2021) Nitrogen dioxide-attributable pediatric asthma in the United States: Burden trends, and environmental justice concerns. American Geophysical Union Fall Meeting, December 15, New Orleans.
7. Martin, G., S.C. **Anenberg**, M. Pescador Jimenez, P. Kinney (2021) Quantifying the public health benefits of expanding green and blue spaces in urban areas. American Geophysical Union Fall Meeting, December 15, New Orleans.
8. Goldberg, D., S.C. **Anenberg**, G. Kerr, E. McDuffie, S. Smith, Z. Lu, D. Streets (2021) Reconciling differences between satellite-inferred NOx emissions and inventories in global cities. American Geophysical Union Fall Meeting, December 15, New Orleans.
9. Kerr, G. D. Goldberg, I. Kheirbek, L. Mahoney, D. Oladini, S.C. **Anenberg** (2021) The COVID-19 natural experiment: Insights into trends drivers, and impacts of nitrogen dioxide pollution. American Geophysical Union Fall Meeting, December 15, New Orleans.

10. Southerland, V., V. Parasram, S.C. **Anenberg** (2021) Temporal trends in land use and environmental justie near hazardous industrial facilities across the US. American Geophysical Union Fall Meeting, December 15, New Orleans.
11. **Anenberg**, S.C. (2021) Temporal trends in urban air pollution and associated disease burdens globally. American Geophysical Union Fall Meeting, December 15, New Orleans.
12. **Anenberg**, S.C. (2021) Public health impacts of environmental pollution. International Conference on Sustainable Energy-Water-Environment Nexus in Desert Climate 2021 (ICSEWEN21), November 24.
13. **Anenberg**, S.C. (2021) Cambio climático, contaminación atmosférica y salud humana: De la investigación a la política, Calidad del Aire y Salud Pública - CASAP VIII, November 4.
14. **Anenberg**, S.C. (2021) Using satellite data to address air pollution and climate change: Bridging science to policy, NASA Plankton, Aerosol, Cloud, ocean Ecosystem (PACE) 2nd Applications Workshop, September 15, virtual.
15. **Anenberg**, S.C. (2021) Climate change, air pollution, and public health impacts: Past, present, and future, Meteorology and Climate – Modeling for Air Quality Conference (MAC-MAQ), September 14.
16. **Anenberg**, S.C. (2021) Overview of the NASEM workshop on leveraging advances in remote geospatial technologies to inform precision environmental health decisions, National Institute for Environmental Health Sciences, June 15, virtual.
17. **Anenberg**, S.C. and I. Kheirbeck (2021) Methods and tools to integrate air quality and health into urban climate action planning. Wellcome Trust Our Planet Our Health Knowledge Sharing Seminar: Policy Engagement, May 21, virtual.
18. **Anenberg,** S.C. (2021) Using satellite remote sensing to estimate air pollution health impacts in cities worldwide. American Thoracic Society Annual Meeting, May 17, virtual.
19. Marwah, H., N. Rosseau, S. Mangipudi, C. Ward, H. Akselrod, R. Harold, S. **Anenberg**, A. Keswani (2021) Investigating air pollution as a contributor to health disparities during the COVID-19 pandemic. 2021 Clinical Climate Change Conference, Jan. 8.
20. **Anenberg**, S.C., M. Castillo, D. Goldberg, D. Henze, P. Kinney, D. Malashock, J. Marshall, A. Mohegh, O. Nawaz, V. Southerland, C. Tessum, M. Brauer, Z. Chafe, M. Harris, C. Heaps, I. Kheirbek, G. Kleiman, J. Kuylenstierna, C. Malley, A. Roy, C. Thomas (2021) Recent Advances in Integrating Climate Change, Air Quality, and Public Health into Urban Decision-Making. American Meteorological Society, Jan. 15 (Invited Core Science Keynote)
21. Kerr, G., D. Goldberg, S.C. **Anenberg** (2021) Impact of Coronavirus Lockdowns on NO2: Successes and Challenges for Environmental Inequality in the United States. American Meteorological Society Annual Meeting, Jan. 11.*
22. Goldberg, D., S.C. **Anenberg**, et al. (2021) Top-down NOx Emissions Estimates for 50 Global Cities during the Last 15 Years. American Meteorological Society Annual Meeting, Jan. 11.*
23. von Salzen, K., S. C. Anenberg, S. Arnold, S. Eckhardt, A. Ekman, M. G. Flanner, M. Gauss, U. Im, Z. Klimont, S. Krishnan, K. Kupiainen, R. Mahmood, D. Olivié, N. Oshima, L. Pozzoli, S. Rao, M. Sand, M. Sigmond, K. Tsigaridis, S. Tsyro, S. Turnock, R. van Dingenen, C. Whaley, and B. Winter (2021) Synergistic and competing influences of air pollutants on air quality and Arctic climate. American Meteorological Society Annual Meeting, Jan. 11. *
24. Bowman, K.W., K. Miyazaki, S. **Anenberg**, et al. (2020) Global air quality responses to the COVID-19 pandemic. American Geophysical Union Fall Meeting, Dec. 8. *

25. Goldberg, D.L., S. **Anenberg**, D. Griffin, C.A. McLinden, G.H. Kerr, Z. Lu, D.G. Streets (2020) Using TROPOMI and re-analysis meteorology to disentangle the impact of the COVID-19 lockdowns on urban NO2 from natural variability. American Geophysical Union Fall Meeting, Dec. 7. *
26. Castillo, M., P. Kinney, V. Southerland, R. Martin, A. van Donkelaar, S. **Anenberg** (2020) Using satellite remote sensing to estimate intra-urban PM2.5 health-related inequalities and environmental injustices in Washington, DC. American Geophysical Union Fall Meeting, Dec. 16. *
27. Malashock, D., S. **Anenberg**, M. DeLang, J. Becker, M.L. Serre, J.J. West, K-L Chang, O.R. Cooper (2020) Evaluating ozone trends and attributable mortality in urban areas worldwide. American Geophysical Union Fall Meeting, Dec. 16. *
28. **Anenberg**, S., D.L. Goldberg, G.H. Kerr, Z. Lu, D. Griffin, C.A. McLinden, B.N. Duncan, J. Miller, R.J. Minjares, J. Dreessen (2020) Inconsistent NO2 drops during COVID-19 lockdowns: lessons for protecting near-term public health and designing longer-term environmental policies. American Geophysical Union Fall Meeting, December 10. (Invited)
29. Nawaz, M.O., D. Henze, D. Goldberg, S. **Anenberg**, D. Jo, B. Nault, J.L. Jimenez, H. Cao, C. Harkins, Z. Qu (2020) Characterizing the regional, sectoral and species-specific sources of pollution exposure and its associated health impacts in urban environments: case studies in Washington, D.C. and Santiago, Chile. American Geophysical Union Fall Meeting, Dec. 14.*
30. Kerr, G.H., D.L. Goldberg, S. **Anenberg** (2020) Environmental injustices associated with coronavirus-related changes in NO2 pollution, American Geophysical Union Fall Meeting, Dec. 14. *
31. **Anenberg**, S.C., D. Goldberg, G. Kerr (2020) NO2 changes during COVID-19 lockdowns in North American, IGAC/AMIGO Workshop: Changes in Atmospheric Composition During the COVID-19 Lockdowns, November 3. (Invited)
32. Goldberg, D., S. Anenberg, G. Kerr, Z. Lu, C. McLinden, D. Griffin (2020) Disentangling the impact of COVID-19 lockdowns on urban NO2 from natural variability, Community Modeling and Analysis System (CMAS) Conference, virtual, October 29. *
33. Castillo, M., S. **Anenberg**, V. Southerland, A. Van Donkelaar, R. Martin (2020) Using satellite remote sensing to estimate intra-urban disparities in air pollution health impacts in Washington, DC. International Society for Environmental Epidemiology, virtual, August 24-27. *
34. Nelson, M., M. Castillo, V. Southerland, S. **Anenberg** (2020) Nature and well-being: Estimating the effects of exposure to green space on health disparities across Washington, DC. International Society for Environmental Epidemiology, virtual, August 24-27. *
35. Rao, S., S. **Anenberg**, R. Van Dingenen, A. Diz-Lois Palomares, Z. Klimont, K. Von Salzen (2020) Air quality and health impacts of integrated global greenhouse gas and air pollution emission scenarios. International Society for Environmental Epidemiology, virtual, August 24-27. *
36. Southerland, V., S. **Anenberg**, A. Roy, M. Harris (2020) Assessing the distribution of air pollution health risks within cities: a neighborhood-scale analysis leveraging high resolution datasets in the Bay Area, California. International Society for Environmental Epidemiology, virtual, August 24-27. *

37. Malashock, D., S. **Anenberg**, K-L Chang, O. Cooper, J. West (2020) Estimates of ozone-attributable burden of disease in urban areas worldwide. International Society for Environmental Epidemiology, virtual, August 24-27. *
38. Mohegh, A., D.L. Goldberg, S. **Anenberg** (2020) The influence of spatial resolution on NO2-attributable pediatric asthma burden estimates at the global, national, and urban scale. International Society for Environmental Epidemiology, virtual, August 24-27. *
39. Burkart, K., S. Wozniak, S.C. **Anenberg**, P. Hystad, D. Goldberg, A. Larkin, A. Mohegh, M. Brauer (2020) Evaluating the strength of evidence between long-term NO2 exposure and pediatric asthma incidence for potential inclusion into the Global Burden of Disease Study. International Society for Environmental Epidemiology, virtual, August 24-27. *
40. **Anenberg**, S., M. Brauer, P. Hystad, K. Burkart, D.L. Goldberg, A. Larkin, A. Mohegh, S. Wozniak, B. Duncan, L. Lamsal (2020) Long-term trends in NO2 exposure and associated pediatric asthma impacts in urban areas worldwide. International Society for Environmental Epidemiology, virtual, August 24-27.
41. **Anenberg**, S. (2020) Air pollution, COVID-19, and public health: what we know and don't know. Japan Geophysical Union and American Geophysical Union Joint Meeting, July 13.
42. **Anenberg**, S. (2020) Inconsistent effects of COVID-19 lockdowns on NO2 pollution in cities globally: Evidence from satellite remote sensing and chemical transport modeling. National Academies Committee on Seismology and Geodynamics, July 14.
43. **Anenberg**, S., M. Brauer, D. Goldberg (2020) Taking a wider view of NO2 pollution: Estimating NO2's health impacts from local to global scales. NASA Health and Air Quality Applied Science Team 2020 Webinar Series, March 3.
44. Goldberg, D., S. **Anenberg**, A. Mohegh, Z. Lu, D. Streets (2020) Applications of satellite NO2 data. Air and Waste Management Regional Air Quality Symposium, College Park, MD, Feb. 13. *
45. **Anenberg**, S. (2020) Recent advances in assessing health impacts of air pollution within cities worldwide. American Meteorological Society, Boston, MA, Jan. 15.
46. Roy, A., V. Southerland, M. Harris, S. **Anenberg** (2020) Disparities in the health burden of air pollution on the hyperlocal scale: Case study for the California Bay Area. American Meteorological Society, Boston, MA, Jan. 15. *
47. **Anenberg**, S. (2020) The U.S. Clean Air Act: Successes and challenges for air quality and health. National Council on Science and the Environment, Washington, DC, Jan. 6.
48. Southerland, V.T., S.C. **Anenberg**, M. Harris, A. Roy, J. Apte, P. Hystad, A. Vodonos, J. Schwartz (2019) Assessing the distribution of air pollution health risks within cities: a neighborhood-scale analysis leveraging high resolution datasets in the Bay area, California. American Geophysical Union, San Francisco, CA, Dec. 19.*
49. Goldberg, D.L., S. **Anenberg**, A. Mohegh, B. de Foy, D. Griffin, C. McLinden, B. Duncan, N. Krotkov, L. Lamsal, F. Liu, O. Nawaz, D. Henze, Z. Lu, D. Streets (2019) High-resolution NO2 exposure estimates and top-down NOx emissions using OMI NO2 and TROPOMI NO2. American Geophysical Union, San Francisco, CA, Dec. 19.*
50. Nawaz, M.O., D.K. Henze, S.C. **Anenberg**, D. Goldberg, Z. Qu (2019) Source attribution of PM2.5 and O3 concentrations and health outcomes from 2010 and 2011 in Washington D.C. using sensitivity analyses in the GEOS-Chem adjoint model. American Geophysical Union, San Francisco, CA, Dec. 19.*
51. Xu, J., R.V. Martin, A. White, X. Yue, L.J. Mickley, D. Henze, J. Luken, M. Amend, H. Roman, J. Neumann, S.C. **Anenberg**, A. Crimmins (2019) Uncertainties in future western

U.S. wildfires and their impacts on air quality. American Geophysical Union, San Francisco, CA, Dec. 19.*

52. Mohegh, A., S. **Anenberg**, D. Goldberg (2019) Influence of spatial resolution on NO2-attributable asthma incidence. American Geophysical Union, San Francisco, CA, Dec. 19.*
53. **Anenberg**, S. (2019) Health impacts of transportation-related air pollution. EDF Emerging Issues Workshop – Leveraging High-Resolution Transportation Data to Create Healthier Cities, New York, NY, Nov. 21.
54. **Anenberg**, S. (2019) Nexus of extreme heat, air quality, climate, and health. National Oceanic and Atmospheric Administration Annual Earth System Science and Modeling Community Workshop, Silver Spring MD, Nov. 19.
55. Goldberg, G., Z. Lu, D. Streets. S. **Anenberg**, P. Achakulwisut, A. Mohegh, V. Southerland, B. Duncan, L. Lamsal, N. Krotkov, F. Liu, D. Griffin, C. McLinden, B. de Foy (2019) Estimating air pollution emissions, exposures, and public health impacts in cities worldwide. New Applications in the Use of Satellite Data Monitoring for Population Health, Huntsville, AL, October 10.*
56. Goldberg, G., Z. Lu, D. Streets. S. **Anenberg**, P. Achakulwisut, A. Mohegh, V. Southerland, B. Duncan, L. Lamsal, N. Krotkov, F. Liu, D. Griffin, C. McLinden, B. de Foy (2019) Policy-relevant applications of satellite data: Estimating air pollution emissions, exposures, and public health impacts in cities worldwide. NASA Health and Air Quality Applied Science Team 6th Meeting, Pasadena, CA, July 10.*
57. Nawaz, O., D.K. Henze, C.S. Malley, J.C.I. Kuylenstierna, H.W. Vallack, Y. Davila, S.C. **Anenberg**, S. Terry, A. Curry-Brown, N. Fann, E. Lefevre, C. Heaps, S. Penn, H. Roman, J. Neumann (2019) Source attribution of climate and health impacts from aerosols. 9th International GEOS-Chem Meeting, Cambridge, MA, May 6.*
58. Achakluwisut, P., M. Brauer, P. Hystad, S.C. **Anenberg** (2019) Global, national, and urban burdens of pediatric asthma incidence attributable to ambient NO2 pollution. Health Effects Institute Annual Meeting, Seattle, Washington, May 6.*
59. Achakulwisut, P., S.C. **Anenberg**, J.E. Neumann, S.L. Penn, A. Crimmins, N. Fann, J. Martinich, L.J. Mickley (2019) Sensitivity of airborne dust to drought in the US Southwest: what are the implications for public health under future climate change? American Meteorological Society, Phoenix, Arizona, Jan. 9.*
60. Achakulwisut, P., S.C. **Anenberg**, M. Brauer, D. Moran, P. Hystad, C. Kalman, D. Henze, J. Apte (2019) Using satellite-derived data to estimate the burden of disease from ambient air pollution in cities worldwide, American Meteorological Society, Phoenix, Arizona, Jan. 8.*
61. **Anenberg**, S.C. (2019) The HAQAST Indicators Tiger Team: Using remote sensing to track air quality and climate change effects, NASA Health and Air Quality Applied Science Team 5th Meeting, Phoenix, Arizona, Jan. 3.
62. Henze, D.K., C. Malley, J.C.I. Kuylenstierna, R.W. Pinder, S. Terry, H. Vallack, C. Heaps, E. Lefevre, S. **Anenberg**, S.L. Penn, A. Curry-Brown, N. Fann, J. Neumann, H. Roman, K. Hicks, Y. Davila, E.A. Marais, F. Lacey (2018) Linking global-scale and urban-scale integrated assessment tools, American Geophysical Union Fall Meeting, Washington, DC, Dec. 12.*
63. Kinney, P., Y. Liu, S. **Anenberg**, M.Z. Al-Hamdan, F. Freedman, M. Castillo (2018) Developing high resolution particulate matter surfaces for use in community health assessments, American Geophysical Union Fall Meeting, Washington, DC, Dec. 14.*

64. Achakulwisut, P., S.C. **Anenberg**, J.E. Neumann, S.L. Penn, A. Crimmins, N. Fann, J. Martinich, L.J. Mickley (2018) Linkages between drought and dust in the US Southwest: Implications for air quality and public health under future climate change, American Geophysical Union Fall Meeting, Washington, DC, Dec. 10.*
65. Neumann, J.E., S. **Anenberg**, K.R. Weinberger, M. Amend, S. Gulati, A. Crimmins, H. Roman, N. Fann, P.L. Kinney (2018) Estimates of the present and future asthma emergency department visits associated with exposure to oak, birch, and grass pollen in the United States, American Geophysical Union Fall Meeting, Washington, DC, Dec. 13.*
66. **Anenberg**, S., P. Achakulwisut, M. Brauer, D. Henze, P. Kinney, C. Kalman (2018) Using satellite-derived surface concentrations to estimate the mortality associated with ambient air pollution in cities worldwide, American Geophysical Union Fall Meeting, Washington, DC, Dec 12.
67. **Anenberg**, S. (2018) From science to policy: Estimating the health impacts of air pollution to inform decision-making. American Geophysical Union Fall Meeting, Washington, DC, Dec 11.
68. Achakulwisut, P. and S. **Anenberg** (2018) Linkages between drought and dust in the US Southwest: Implications for air quality and public health under future climate change, U.S. Air Quality Seminars and Discussion, Washington, DC, Oct 9.*
69. **Anenberg**, S. (2018) NASA HAQAST Hi-Res Tiger Team: Neighborhood-scale air pollution health impact assessment, NASA Health and Air Quality Applied Science Team webinar, Washington, DC, Sept. 28.
70. **Anenberg**, S., H.A. Roman, M. Amend (2018) Future wildfires and air pollution-related health damages, International Society for Environmental Epidemiology, Ottawa, Canada, August 27.*
71. **Anenberg,** S. and A. Lindahl (2018) Neighborhood scale health impacts from PM2.5 in four United States metropolitan areas, International Society for Environmental Epidemiology, Ottawa, Canada, August 27.*
72. **Anenberg**, S. (2018) Using satellite-derived PM2.5 to estimate neighborhood scale health impacts, NASA Health and Air Quality Applied Science Team 4, Madison, WI, July 17.
73. **Anenberg,** S. (2018) Alaskan Pollution and Chemical Analysis workshop: Approaches to atmospheric health effect/impact studies, Alaskan Pollution and Chemical Analysis workshop, Fairbanks, AK, May 14.
74. Schmale, J., K. Law, S. Arnold, T. Thorp, K. Pratt, W. Simpson, J. Mao, S. **Anenberg**, A. Evgrafova, P. Tejsner, A. Rautio (2018) Impacts of future Arctic air pollution: Designing a transdisciplinary research agenda for sustainable development, Polar 2018 Conference, Davos, Switzerland, June 15-26.*
75. **Anenberg**, S. and R. Doherty (2018) The global burden of ambient air pollution on asthma. Planetary Health Annual Meeting, Edinburgh, UK, May 29.*
76. **Anenberg**, S., H.A. Roman, M. Amend (2018) Future wildfires and air pollution-related health damages, Planetary Health Annual Meeting, Edinburgh, UK, May 29.*
77. Bangoura, A. and S. **Anenberg** (2018) Impact of water, sanitation, and hygiene interventions on environmental enteric dysfunction in children in developing countries: A systematic review, George Washington University Research Days, Washington, DC, April 11.*
78. **Anenberg,** S. and A. Lindahl (2018) Neighborhood scale health impacts from PM2.5 in four United States metropolitan areas, George Washington University Research Days, Washington, DC, April 11.* *Awarded best poster in Sustainability category*

79. Koziomko, J. and S. **Anenberg** (2018) Recycled tire crumb rubber playgrounds or athletic fields and air pollution hazards to children: A systematic review, George Washington University Research Days, Washington, DC, April 11.*
80. Val Martin, M., B. Ford, S. Zelinsky, C.L. Heald, F. Li, D.M. Lawrence, S. **Anenberg**, E.V. Fischer, J.R. Pierce (2017) Quantifying future US PM2.5 and associated health effects due to changes in wildfires, American Geophysical Union Fall Meeting, New Orleans, LA, Dec. 11-15.*
81. Chafe, Z., S. **Anenberg**, Z. Klimont, K. Kupiainen, J. Lewis, J. Metcalfe, P. Pearson (2017) Mitigation of short-lived climate pollutants from residential coal heating and combined heating/cooking stoves: Impacts on the cryosphere, policy options, and co-benefits, American Geophysical Union Fall Meeting, New Orleans, LA, Dec. 11-15.*
82. Law, K., J. Schmale, S. **Anenberg**, S. Arnold, W.R. Simpson, J. Mao, S. Starkweather (2017) Local air pollution in the Arctic: Knowledge gaps, challenges, and future directions, American Geophysical Union Fall Meeting, New Orleans, LA, Dec. 11-15.*
83. Achakulwisut, P., L.J. Mickley, L. Shen, S. **Anenberg** (2017) What controls springtime fine dust variability in the western United States? Implications for air quality and public health risks under future climate change, American Geophysical Union Fall Meeting, New Orleans, LA, Dec. 11-15.*
84. Henze, D.K., Y. Davila, S. **Anenberg**, C. Malley, J.C.I. Kuylenstierna, H. Vallack, M.R. Ashmore, M. Turner, K. Sudo, J.E. Jonson, M. Chin, R.M. Doherty (2017) Is ozone, rather than PM2.5, actually the largest contributor to premature deaths associated with trans-continental transport of air pollution? American Geophysical Union Fall Meeting, New Orleans, LA, Dec. 11-15.*
85. Kupiainen, K., N. Karvosenoja, S. **Anenberg** (2017) Workshop on Climate change, air pollution and health: Strengthening the evidence base for policy making in Nordic countries, Oslo, Norway, Dec. 1.*
86. **Anenberg,** S. (2017) Estimating the global burden of ambient air pollution on asthma using satellite-derived exposure estimates, NASA Health and Air Quality Applied Science Team Meeting, Palisades, NY, Nov. 28, 2017.
87. **Anenberg**, S. (2017) Climate and respiratory health – the health implications of air pollution and climate change, Climate and Respiratory Health – Focus Asthma Workshop at The Collider, Asheville, NC, Nov. 9. *(Invited keynote)*
88. **Anenberg**, S. (2017) Air pollution health impact assessment: Previous work and considerations for Arctic-specific analyses, air Pollution in the Arctic: Climate, Environment and Societies (PACES) 2nd Workshop, Victoria, Canada, June 27.
89. **Anenberg**, S.C., J. Miller, R. Minjares, L. Du, D. Henze, F. Lacey, C. Malley, L. Emberson, V. Franco, Z. Klimont, C. Heyes (2017) Impacts and mitigation of excess diesel NOx emissions in 11 major vehicle markets, Health Effects Institute Annual Meeting, Alexandria, VA, Apr. 29 – May 2. *(Invited)*
90. **Anenberg**, S.C. (2017) Global ICCT scenarios for road transport… and other ongoing activities, UNECE Convention on Long-Range Transboundary Air Pollution, Task Force on Integrated Assessment Modeling, Geneva, Switzerland, May 2. *(Invited)*
91. Lacey, F., C. Weidinmyer, S. **Anenberg**, D. Henze (2017) Arctic temperature impacts from regional and national home heating emissions, Climate and Clean Air Coalition Summit on Black Carbon and Other Emissions from Residential Coal Heating Stoves and Combined Cooking + Heating Stoves, Warsaw, Poland, May 30.

92. **Anenberg**, S.C., K. Weinberger, H. Roman, J. Neumann, A. Crimmins, N. Fann, J. Martinich, P. Kinney (2017) Impacts of oak pollen on allergic asthma in the United States and potential influence of future climate change, Planetary Health Annual Meeting, Boston, MA, Apr. 26.*
93. **Anenberg**, S.C., E. Carter, Z. Chafe, Z. Klimont, F. Lacey, J. Metcalfe, P. Pearson (2017) Combined heating and cooking stoves and coal heating stoves: Global air quality, health, climate, cryosphere, and environmental impacts, International Conference on Arctic Science: Bringing Knowledge to Action, Washington, DC, Apr. 25.
94. **Anenberg**, S.C. (2017) Metrics for accounting for the health impacts of black carbon and methane interventions, Climate and Clean Air Coalition Workshop on Metrics for Evaluating and Reporting on Black Carbon and Methane Emissions, Ottawa, Canada, Mar. 16. *(Invited)*
95. **Anenberg**, S.C. (2017) Estimating the global health benefits of emissions mitigation: Example of diesel NOx, NASA Health and Air Quality Applied Science Team 2nd meeting, Seattle, WA, Feb. 28.
96. Henze, D.K., S. **Anenberg**, J. Miller, V. Franco, L. Du, L. Emberson, F. Lacey, C. Malley, R. Minjares (2016) Integrated assessment of health, crop, and climate impacts of mitigating excess diesel NOx emissions in 11 major vehicle markets, American Geophysical Union Fall Meeting, San Francisco, CA, Dec. 11-16.*
97. **Anenberg**, S., J. Miller, F. Lacey, D. Henze, V. Franco, L. Du, R. Minjares, C. Malley, L. Emberson (2016) Health and climate impacts in and from selected G-20 countries using realistic diesel emissions under present and future scenarios, International Global Atmospheric Chemistry Project Science Conference, Breckenridge, CO, Sept. 26-30.*
98. **Anenberg**, S., J. Miller, V. Franco, L. Du, F. Lacy, D. Henze, C. Malley, R. Minjares (2016) Impacts and mitigation of excess diesel NOx emissions in 11 major vehicle markets, 17th IUAPPA World Clean Air Congress and 9th CAA Better Air Quality Conference, Busan, South Korea, Aug. 29 – Sept. 2.
99. Fann, N., S. **Anenberg**, J. Kuylenstierna, H. Vallack (2014) New tools for estimating the human health benefits of reducing short-lived climate pollutants, Better Air Quality Conference, Oral presentation, Colombo, Sri Lanka, Nov. 19-21.*
100. West, J., S.J. Smith, R. Silva, V. Naik, Z. Adelman, M.M. Fry, S. **Anenberg**, Y. Zhang, L.W. Horowitz, J.-F. Lamarque, L.K. Emmons (2012) Co-benefits of Global Greenhouse Gas Mitigation for Future Air Quality and Human Health via Two Mechanisms, American Geophysical Union (AGU) Fall Meeting 2012, Oral presentation, San Francisco, CA, Dec. 3-7.*
101. Silva, R.A., S.C. **Anenberg**, J.J. West, J.-F. Lamarque, D. Shindell, D. Bergmann, T.K. Bernsten, P. Cameron-Smith, W.J. Collins, S.J. Ghan, B. Josse, T. Nagashima, V. Naik, D. Plummer, J.M. Rodriguez, S. Szopa, G. Zeng (2012) The impact of projected future air pollutant emissions on global human mortality, American Geophysical Union (AGU) Fall Meeting 2012, Oral presentation, San Francisco, CA, Dec. 3-7.*
102. Akhtar, F., B. Henderson, S. Napelenok, D. Henze, S. **Anenberg**, J. Langstaff, R. Pinder (2012) Quantifying the sensitivity of U.S. ozone concentrations to domestic vs. international emissions through coupled GEOS-Chem Adjoint and CMAQ DDM source-receptor modeling, Community Modeling and Analysis System (CMAS) Conference, Oral presentation, Durham, NC, Oct. 15-17.*
103. Silva, R.A., S.C. **Anenberg**, J.J. West, J.-F. Lamarque, D. Shindell, D. Bergmann, T.K. Bernsten, P. Cameron-Smith, W.J. Collins, S.J. Ghan, B. Josse, T. Nagashima, V. Naik, D.

Plummer, J.M. Rodriguez, S. Szopa, G. Zeng (2012) The impact of projected future air pollutant emissions on global human mortality, Community Modeling and Analysis System (CMAS) Conference, Poster presentation, Durham, NC, Oct. 15-17.*

104. Zhang, Y., J.J. West, M. Fry, Z. Adelman, R. Silva, S. Smith, V. Naik, S. **Anenberg**, L.W. Horowitz, J.-F. Lamarque (2012) Effects of changes in emissions and climate change on global air quality: a study of the air quality co-benefits of GHGs mitigation, Community Modeling and Analysis System (CMAS) Conference, Poster presentation, Durham, NC, Oct. 15-17.*
105. Silva, R.A., S.C. **Anenberg**, J.J. West, J.-F. Lamarque, D. Shindell, D. Bergmann, T.K. Bernsten, P. Cameron-Smith, W.J. Collins, S.J. Ghan, B. Josse, T. Nagashima, V. Naik, D. Plummer, J.M. Rodriguez, S. Szopa, G. Zeng (2012) The impact of projected future air pollutant emissions on global human mortality, International Society for Environmental Epidemiology, Poster presentation, Columbia, SC, August 27-30.*
106. West, J.J., S.J. Smith, R.A. Silva, V. Naik, Z. Adelman, M.M. Fry, S. **Anenberg**, Y. Zhang, L.W. Horowitz, J.-F. Lamarque, L. Emmons (2012) Co-benefits of global greenhouse gas mitigation for future air quality and human health via two mechanisms, International Society for Environmental Epidemiology, Poster presentation, Columbia, SC, August 27-30.*
107. **Anenberg**, S.C., B. Henderson, C. Fulcher, J. Langstaff, K. Wesson, S. Dutton, F. Akhtar, Z. Pekar, N. Fann, P. Dolwick, B. Hubbell, L. Zhang (2012) Contributions of international anthropogenic emissions to ozone-related mortality in the United States, International Society for Environmental Epidemiology, Poster presentation, Columbia, SC, August 27-30.
108. Kuylenstierna, J.C.I., D. Shindell, Z. Klimont, R. van Dingenen, M. Amann, S. **Anenberg**, E. Vignati, F. Raes, H. Vallack, K. Hicks, L. Emberson, D. Streets, M. Williams, R. Mills, K. Oanh, L. Cifuentes, V. Ramanathan (2012) Achieving multiple climate and clean air benefits: Mitigating short-lived climate forcers, Planet Under Pressure Conference, Poster presentation, London, UK, March 26-29.*
109. **Anenberg**, S.C., with UNEP/WMO Black Carbon and Tropospheric Ozone Assessment Team (2011) Health co-benefits of mitigating short-lived climate forcers, AGU Fall Meeting, Oral presentation, San Francisco, CA, December 4-9. *(Invited).*
110. **Anenberg**, S.C., J.J. West, M. Schulz, H. Bian, T. Diehl, R. Doherty, A. Fiore, P. Hess, J.E. Jonson, R. Park, D. Shindell, T. Takemura (2011) Impacts of intercontinental transport of aerosols on human mortality, AGU Fall Meeting, Poster presentation, San Francisco, CA, December 4-9.*
111. West, J.J. S.J. Smith, R.G. Silva, Z. Adelman, M. Fry, S. **Anenberg**, L.W. Horowitz, J.-F. Lamarque, L. Emmons (2011) Co-benefits of global greenhouse gas mitigation for air quality and human health via two mechanisms, AGU Fall Meeting, Poster presentation, San Francisco, CA, December 4-9.*
112. Silva, R., Z. Adelman, M. Fry, S.C. **Anenberg**, J.J. West (2011) The contribution of anthropogenic emissions sectors to the global burden of human mortality due to ozone and particulate matter air pollution, 10th Annual Community Modeling and Analysis System (CMAS) Conference, Poster presentation, Durham, NC, Oct. 24-26.*
113. **Anenberg,** S.C., K. Talgo, P. Dolwick, C. Jang, S. Arunachalam, J.J. West (2010) Sensitivity of surface air quality and global mortality to global, regional, and sectoral black

carbon emission reductions, AGU Fall Meeting, Oral presentation, San Francisco, CA, December 13-17. (*Outstanding Student Paper Award).*

114. **Anenberg**, S.C., K. Talgo, P. Dolwick, C. Jang, S. Arunachalam, J.J. West (2010) Sensitivity of surface air quality and global mortality to global, regional, and sectoral black carbon emission reductions, 9th Annual CMAS Conference, Poster presentation, Durham, NC, October 11-13.
115. **Anenberg**, S.C., K. Talgo, J.J. West (2010) Impacts of global and US black carbon emission reductions on human mortality, AAAR Specialty Conference on Air Pollution and Health, Poster presentation, San Diego, CA, March 22-26.
116. **Anenberg**, S.C., L.W. Horowitz, D.Q. Tong, J.J. West (2010) Estimating the global burden of mortality due to outdoor air pollution using atmospheric modeling, AAAR Specialty Conference on Air Pollution and Health, Oral presentation, San Diego, CA, March 22-26.
117. **Anenberg**, S.C., J.J. West, A.M. Fiore, D.A. Jaffe, M.J. Prather, D. Bergmann, C. Cuvelier, F.J. Dentener, B.N. Duncan, M. Gauss, P. Hess, J.E. Jonson, A. Lupu, I.A. MacKenzie, E. Marmer, R.J. Park, M. Sanderson, M. Schultz, D.T. Shindell, S. Szopa, M. Garcia Vivanco, O. Wild, and G. Zeng (2010) Impacts of intercontinental ozone pollution on human mortality, HTAP 2010 Assessment Workshop, Poster presentation, Chapel Hill, NC, March 1-2.
118. **Anenberg**, S.C., J.J. West, A.M. Fiore, D.A. Jaffe, M.J. Prather, D. Bergmann, C. Cuvelier, F.J. Dentener, B.N. Duncan, M. Gauss, P. Hess, J.E. Jonson, A. Lupu, I.A. MacKenzie, E. Marmer, R.J. Park, M. Sanderson, M. Schultz, D.T. Shindell, S. Szopa, M. Garcia Vivanco, O. Wild, and G. Zeng (2009) Impacts of intercontinental ozone pollution on human mortality, 8th Annual CMAS Conference, Poster presentation, Durham, NC, October 19-21.
119. **Casper**, S., J.J. West, L.W. Horowitz, D.Q. Tong (2008) The global burden of anthropogenic ozone and particulate matter air pollution on premature human mortality, Joint ISEE/ISEA Conference, Poster presentation, Pasadena, CA, October 12-16.
120. **Casper**, S., J.J. West, L.W. Horowitz, D.Q. Tong (2008) The global burden of anthropogenic ozone and particulate matter air pollution on premature human mortality, 7th Annual CMAS Conference, Oral presentation, Raleigh, NC, October 6-8.
121. **Casper**, S., J.J. West, L.W. Horowitz, D.Q. Tong (2008) The global burden of anthropogenic ozone and particulate matter air pollution on premature human mortality, LRTAP Task Force on Hemispheric Transport of Air Pollution, Atmospheric Chemistry, Climate, and Transboundary Air Pollution Workshop, Poster presentation, Washington, DC, June 9.
122. **Casper**, S. J.J., West, L.W. Horowitz, D.Q. Tong (2008) The global burden of anthropogenic ozone and particulate matter air pollution on premature human mortality, 40th Annual Air Pollution Workshop, Poster presentation, Raleigh, NC, April 8. (*First place award for best student poster*).

Other Invited Presentations

123. **Anenberg,** S.C. (2022) Mitigating climate change, urban air pollution, and associated health inequities: Challenges and opportunities. Boston University School of Public Health, March 3.

124. **Anenberg**, S.C. (2022) Climate change, air pollution, and public health: Bridging science to policy, Part 2, Data to inform decision-making. Grand Rounds in Environmental Health and Engineering. Johns Hopkins University, March 11.
125. **Anenberg**, S.C. (2022) Climate change, air pollution, and public health: Bridging science to policy, Part 1. John C. and Susan S.G. Wierman Lecture Series in Air Quality Data Analysis. Johns Hopkins University, February 10.
126. **Anenberg**, S.C. (2022) Air quality, health, and equity in the Washington, DC region. Clean Air Partners, February 9.
127. **Anenberg**, S.C. (2021) Using satellite data to address air pollution and climate change: Bridging science to policy. George Washington University Geography Department, Dec. 10.
128. **Anenberg**, S.C. (2021) Inconsistent NO2 drops during COVID-19 lockdowns: Lessons for protecting near-term public health and designing longer-term environmental policies. CDC Zoonoses and One Health Update calls, November 18.
129. **Anenberg**, S.C. (2021) Inconsistent NO2 drops during COVID-19 lockdowns: Lessons for protecting near-term public health and designing longer-term environmental policies. Royal Meteorological Society, November 18.
130. **Anenberg**, S.C. (2021) Air quality, health, and equity in the Washington, DC region. Metropolitan Washington Air Quality Committee, Air and Climate Public Advisory Committee, November 15.
131. **Anenberg**, S.C. (2021) Air quality, health, and equity in the Washington, DC region. Metropolitan Washington Air Quality Committee, October 27.
132. **Anenberg**, S.C. (2021) Air pollution and health in Arctic Council Member and Observer Countries. AMAP Side Event at COP26, Glasgow, UK, November 3.
133. **Anenberg**, S.C. (2021) Methods and tools to integrate air quality and health into urban climate action planning. InterMET webinar, October 27.
134. **Anenberg**, S.C. (2021) Climate change, air pollution, and public health impacts: From science to policy. Boston University Environmental Health seminar series, October 22.
135. **Anenberg**, S.C. (2021) Climate change, air pollution, and public health impacts: From science to policy. University of Maryland, September 23.
136. **Anenberg**, S.C. (2021) Climate change, air pollution, and public health impacts: Past, present, and future. National Institute of Allergy and Infectious Disease Grand Rounds, September 18.
137. Southerland, V.A., S.C. **Anenberg**, M. Harris, J. Apte, P. Hystad, A. van Donkelaar, R.V. Martin, M. Beyers, A. Roy (2021) Assessing the distribution of air pollution health risks within cities: a neighborhood-scale analysis leveraging high resolution datasets in the Bay Area, California. NCAR, June 25.
138. **Anenberg**, S. (2021) NOAA GeoXO Atmospheric Composition Town Hall, April 29.
139. **Anenberg**, S. (2021) Climate change, air pollution, and public health: Past, present, and future. Georgia Tech, April 8.
140. **Anenberg**, S., D. Goldberg, G. Kerr (2021) Inconsistent NO2 drops during COVID-19 lockdowns: lessons for protecting near-term public health and designing longer-term environmental policies. American Geophysical Union Fall Meeting, March 16.
141. **Anenberg**, S. (2021) Leveraging satellite-derived air quality datasets for environmental health applications NASA ACCP Air Quality and Health Workshop, March 16.
142. **Anenberg**, S. (2021) George Washington University Milken Institute School of Public Health Dean's Seminar Series, March 22.

143. **Anenberg**, S. (2021) Air pollution and health in cities: Recent advances and lessons from COVID-19 lockdowns. Air and Waste Management Association Mid-Atlantic Region, February 24.
144. **Anenberg**, S. (2021) Climate change, air pollution, and public health: Past, present, and future. Frontiers in Atmospheric Chemistry Seminar Series, January 26.
145. **Anenberg**, S. (2020) Climate change, air quality, and public health in cities. Urban Land Institute, December 18.
146. **Anenberg**, S., and D. Goldberg (2020) Air quality and health in U.S. cities: Lessons from COVID-19 restrictions. Ozone Transport Commission, November 18.
147. **Anenberg**, S. (2020) Air pollution and health in cities: Recent advances and lessons from COVID-19 lockdowns. Maryland Department of Environment, November 5.
148. **Anenberg**, S. (2020) Clean Air for All: 50 Years of the Clean Air Act, virtual, September 29.
149. Filippelli, G. and S. **Anenberg** (2020) GeoHealth: The impact of climate change on health and society, Wiley Science talks with the American Geophysical Union, virtual, September 22.
150. **Anenberg**, S. (2020) Methods and tools to assess air pollution health impacts in cities. Environmental Defense Fund Workshop "Air Pollution Health Risk Assessments for Decision Making: A Focus on Cities", virtual, September 8.
151. **Anenberg**, S. (2019) Extreme weather, chemical facilities, and vulnerable communities in the U.S. Gulf Coast: A disastrous combination; Sensitivity of Airborne Dust to Drought in the US Southwest: What Are the Implications for Public Health under Climate Change? The Collaborative on Health and the Environment, virtual, Nov. 20.
152. Southerland, V, S. **Anenberg** A. Roy, M. Harris (2019) Hyper-local health impact assessment of NO2, PM2.5, and BC in the Bay Area, California. Environmental Defense Fund, Nov. 14.
153. **Anenberg**, S. (2019) Mitigating global ozone air pollution: challenges and opportunities. World Resources Institute Greening Governance Seminar Series, Washington DC, October 30.
154. Achakulwisut, P., M. Brauer, P. Hystad, S. **Anenberg** (2019) Global, national, and urban burdens of pediatric asthma incidence attributable to ambient NO2 pollution, Health Effects Institute, Washington, DC, April 5.
155. **Anenberg**, S. (2019) Using satellite-derived pollution concentrations to estimate the health impacts of air pollution worldwide, NASA Goddard, College Park, MD, April 22.
156. **Anenberg**, S., J. Miller, D. Henze, R. Minjares (2019) A global snapshot of the air pollution-related health impacts of transportation sector emissions in 2010 and 2015, Health Effects Institute, Washington, DC, March 1.
157. **Anenberg**, S. (2018) Global health impacts of ambient air pollution: Integrating atmospheric science, public health, and environmental policy, Dalhousie University, Halifax, Canada, Sept. 26.
158. **Anenberg**, S. (2018) Using satellite remote sensing to estimate the global burden of ambient air pollution on asthma, NASA Goddard, Greenbelt, MD, Feb. 8.
159. **Anenberg**, S. (2017) The global burden of ambient air pollution on asthma, George Washington University, Milken Institute School of Public Health, Washington, DC, Oct. 16.

160. **Anenberg**, S. (2017) Global public health benefits of mitigating air pollution and climate change, George Washington University, Milken Institute School of Public Health, Washington, DC, Mar. 29.
161. Kleiman, G., S. **Anenberg** (2017) The multiple benefits of clean cooking in Mozambique, World Bank, Washington, DC, Mar. 9.
162. **Anenberg**, S. (2016) Estimating the global health benefits of air pollution mitigation, Health Effects Institute, Boston, MA, Feb. 17.
163. **Anenberg**, S.C. (2016) Impacts and mitigation of excess diesel NOx emissions in 11 major vehicle markets, International Council on Clean Transportation, Washington, DC.
164. **Anenberg**, S.C. (2016) Estimating the global health benefits of air pollution mitigation, National Center for Atmospheric Research (NCAR) Advanced Study Program Summer Colloquium, Boulder, CO, Jul. 25.
165. **Anenberg**, S. (2014) What tools/models are available to assess the health risks of air pollution at various scales (local, national, regional, global)? United Nations Economic Commission for Europe Convention on Long Range Transboundary Air Pollution Task Force on Health, Bonn, Germany, May 14.
166. **Anenberg**, S. (2014) What tools/models are available to assess the health risks of air pollution at various scales (local, national, regional, global)? World Health Organization Expert Meeting on Health Risk Assessment, Bonn, Germany, May 12.
167. **Anenberg**, S.C. (2012) Using atmospheric models to estimate air pollution mortality, University of Maryland, Earth System Science Interdisciplinary Center, Washington, DC, Oct. 15.
168. **Anenberg**, S.C. (2012) Health co-benefits of mitigating near-term climate change through black carbon and methane emission controls, Woodrow Wilson International Center for Scholars, China Environment Forum, Washington, DC, Mar. 14.
169. **Anenberg**, S.C. (2012) Health co-benefits of mitigating near-term climate change, Pacific Northwest National Laboratory, Joint Global Change Research Institute, Washington, DC, Mar. 8.
170. **Anenberg**, S.C. (2012) Health co-benefits of mitigating near-term climate change, Science and Technology Policy Institute, Washington, DC, Mar. 2.
171. **Anenberg**, S.C. (2012) Health co-benefits of mitigating short-lived climate forcers, University of Maryland, Dept. of Atmospheric and Oceanic Sciences, Washington, DC, Feb. 24.
172. **Anenberg**, S.C. (2012) The role of science in the EPA Air Program, American Association for the Advancement of Science, Washington, DC, Sept. 18.
173. **Anenberg**, S.C. (2012) Opportunities for interagency collaboration to move U.S. cookstove research forward, National Science and Technology Council, Air Quality Research Subcommittee, Washington, DC, Nov. 15.
174. **Anenberg**, S.C. (2011) Health impacts of air pollution: thinking globally, U.S. Environmental Protection Agency Office of Air Quality Planning and Standards International Seminar, Research Triangle Park, NC, Apr. 5.
175. **Anenberg**, S.C. (2011) Health impacts of black carbon mitigation, Project Surya Briefing Meeting, Washington, DC, Jun. 14.

SERVICE AND PROFESSIONAL ACTIVITIES

University service

George Washington University

2022 - Elected Senator, Faculty Senate
2022 - Member, GWU Faculty Senate Fiscal Planning and Budget Committee
2020 - 2022 Member, Advisory Council on Research

GWU School of Public Health

2017 - Member, Admissions Committee
2018 – 2021 Co-Chair, Admissions Committee
2019 - 2020 Member, Research Committee
2019 Member, Search Committee for Director of Admissions
2018 Member, Global Health Initiatives Working Group of SPH Strategic Planning Task Force

GWSPH Environmental and Occupational Health Department

2020 - Member, PhD Admissions Committee
2022 - Member and Diversity Advocate, Search Committee for tenure-track faculty member
2019 - 2020 Chair, Search Committee for non-tenure track faculty member

Leadership in profession

2022 – President-Elect, GeoHealth section of the American Geophysical Union
2020 – 2021 Secretary, GeoHealth section of the American Geophysical Union

Professional societies

American Geophysical Union
American Meteorological Society
International Society for Environmental Epidemiology
Earth Science Women's Network

Editorial peer review activities

2018 - Editor, *GeoHealth*
2019 - 2020 Guest Editor, *Proceedings of the National Academy of Sciences* (two papers)
2019 - Founding Associate Editor, *Frontiers in Sustainable Cities: Health and Cities*
2009 - Ad-hoc peer reviewer for academic journals: *Science; Nature; Nature Climate Change; Nature Geoscience; Lancet Planetary Health; Proceedings of the National Academy of Sciences; Aerosol and Air Quality Research; American Journal of Public Health; Atmosphere; Atmospheric Chemistry and Physics; Atmospheric Environment; Atmospheric Science Letters; Challenges in Sustainability; Climate Change Letters; Energy Policy; Energy, Sustainability, and Society; Environment International; Environmental Health Insights; Environmental Health Perspectives; Environmental Modelling and Software; Environmental Monitoring and Assessment; Environmental Pollution; Environmental Research; Environmental Research Letters; Environmental Science and Pollution Research; Environmental Science and Technology; Environmental Science and Technology Letters; Frontiers: Health and Cities;*

GeoHealth; Geophysical Research Letters; Global Environmental Change; International Journal of Environmental Research and Public Health; Israel Journal of Health Policy Research; Journal of Building Engineering; Journal of Exposure Science and Environmental Epidemiology; Journal of Pollution Effects and Control; Journal of Renewable and Sustainable Energy; Journal of Research Reports in Clinical Cardiology; Journal of Urban Climate; North Carolina Medical Journal; PLOS Medicine; PLOS ONE; Risk Analysis; Science of the Total Environment; Sustainability; Trials

2011 - Ad-hoc peer reviewer for research grants: Government of the Hong Kong Special Administrative Region (2011), Carolinas Integrated Sciences and Assessments (2012), Canada Foundation for Innovation (2016), Research Council of Norway grant review panel (2016), National Science Foundation grant review panel (2017), Academia Sinica (2017), French National Research Agency (2018), NASA ROSES Disasters-18 (2018), NOAA Climate Program Office (2020), UK Research and Innovation Strategic Priorities Fund (2020), Vienna Science and Technology Fund (2020), NSF ad-hoc proposal review (2021).

2016 - Ad-hoc peer reviewer for books and reports: Intergovernmental Panel on Climate Change (2013), Heinz Endowments (2016), Climate and Clean Air Coalition (2018), United Nations Environment Programme (2018), Johns Hopkins University Press (2018), U.S. Environmental Protection Agency (2018).

National and international scientific advisory committees

2021 - Author, Transportation chapter of the 5th National Climate Assessment

2021 - Member, U.S. EPA Science Advisory Board, Climate Change Science Committee

2021 - Member, U.S. EPA Clean Air Act Advisory Committee

2021 - Member, National Academies Committee to Advise the U.S. Global Change Research Program (USGCRP)

2021 - Member, World Health Organization Global Air Pollution and Health Technical Advisory Group
Expert Working Group on Exposure Assessment
Expert Working Group on Climate Change and Air Pollution

2018 - 2021 Member, U.S. EPA Clean Air Act Advisory Committee's Mobile Source Technical Review Subcommittee

2021 Chair, National Academies Planning Committee for "Leveraging Advances in Remote Geospatial Technologies to Inform Precision Environmental Health Decisions – A Workshop", April 14-15, 2021

2020 Member, National Academies Board on Atmospheric Sciences and Climate, Planning Committee for "Wildland Fires: Towards Improved Understanding and Forecasting of Air Quality Impacts Workshop", September 23-25, 2020

2018 - 2021 Member, U.S. Representative, and Chapter Lead Author, Arctic Council's Arctic Monitoring and Assessment Programme Expert Group on Short-Lived Climate Forcers

Leadership in organizing scientific workshops and conferences

2021	Session Co-chair, Geospatial Data for Exposure and Risk Modeling: Approaches and Applications, American Geophysical Union Fall Meeting 2021 [redacted]
2021	Session Co-chair, Climate change and health equity: Action at the intersection of social justice and health disparities [redacted]
2020	Session chair, late breaking session on COVID-19 and Earth and Space Science, American Geophysical Union Fall Meeting 2020
2020	Organizer, International Society for Environmental Epidemiology Symposium: Beyond Temperature: Assessing the global burden of disease from climate change, ISEE Annual Meeting, Virtual, 2020 [redacted]
2019	Organizer and Host, Science to Action Roundtable to Advance Joint Air Quality and Climate Change Mitigation in Cities Worldwide, Washington, DC
2016 - 2017	Organizer, Steering Committee, Climate and Clean Air Coalition summit on combined cooking and heating stoves, May 2017, Warsaw, Poland
2014	Organizer, Steering Committee, World Health Organization workshop: "*Methods and tools for assessing the health risks of air pollution at local, national and international level*"
2014	Moderator, President's Task Force Climate Change and Children's Health Expert Consultation, Washington, DC

Participation in expert panels and other professional service

2019 -	Member, Lancet Countdown U.S. Working Group
2016 -	Member, Climate and Clean Air Coalition Roster of Experts
2016 -	Collaborator, Institute for Health Metrics and Evaluation, Global Burden of Disease Study
2018	Judge, Outstanding Student Presentation Awards, American Geophysical Union Fall Meeting
2017	Invited Participant, Climate and Clean Air Coalition Science Advisory Panel Expert Workshop on "Metrics for Evaluation and Reporting on Black Carbon and Methane Interventions" Ottawa, Canada
2014 - 2015	Member, Black Carbon Expert Panel, Gold Standard Foundation
2011 - 2014	RFP author/reviewer, EPA Science to Achieve Results (STAR) Research Grants
2012	Invited expert panelist, U.S. EPA National Center for Environmental Assessment Consultation for a Multipollutant Science Assessment on Climate
2011	Member, Global Alliance for Clean Cookstoves Monitoring and Evaluation Working Group, Climate Working Group, Health Working Group

Community service

2021 -	Maryland Responds Medical Reserve Corps
2018 -	Board Member, Clean Air Partners, Washington DC

TEACHING AND MENTORING

Teaching

Courses taught (all at GWU)

2018 -	Course Director, PubH 6140, Global Climate Change and Air Pollution: Science, Impacts, and Solutions (2 credits) Summer 2018 (5 students), Summer 2019 (12 students), Summer 2020 (7 students), Summer 2021 (14 students)
2017	Course Instructor, PubH 6128, Global Environmental and Occupational Health (2 credits) Session leader Spring I 2017 (14 students)
2016 - 2017	Course Instructor PubH 6004, Environmental and Occupational Health in a Sustainable World (2 credits) Session leader Spring II (14 students), Summer (14 students), Fall 2016 (14 students); Spring I (14 students), Spring II (14 students), Summer 2017 (14 students)

Guest lectures and panels in undergraduate and graduate courses (at GWU unless noted)

2021	PubH 8406, Advanced Topics in Global Health: Doctoral Seminar Part 1
2021	PubH 8412, Environmental and Occupational Health Research and Practice
2021	Introduction to Environmental and Occupational Health, Univ. of Washington Guest lecture on air pollution and climate change
2020 - current	PubH 3131: Epidemiology: Measuring Health and Disease Guest lecture on environmental health and climate change
2019	School of Medicine & Health Sciences PPS-1: Fundamentals of Patients, Populations, and Systems Guest panel on climate change and health
2019	Elliott School of International Affairs IAFF 6138, Climate Change and Sustainable Development Guest lecture on climate change and health
2019	PubH 6121, Environmental and Occupational Epidemiology Guest lecture on air pollution exposure science

Guest lecture recordings for online MPH courses (all at GWU)

2019	PubH 6011, Environmental and Biological Foundations of Public Health Recorded three video lectures
2019	PubH 6136, Environmental and Occupational Epidemiology Recorded video lecture
2017	PubH 6128, Global Environmental and Occupational Health Recorded two video lectures

Advising and Mentoring

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Academic Advisor for MPH students (all EOH at GWU, designated by year the students entered MPH program at GWU):

2021	13 students
2020	11 students
2019	21 students
2018	15 students
2017	7 students

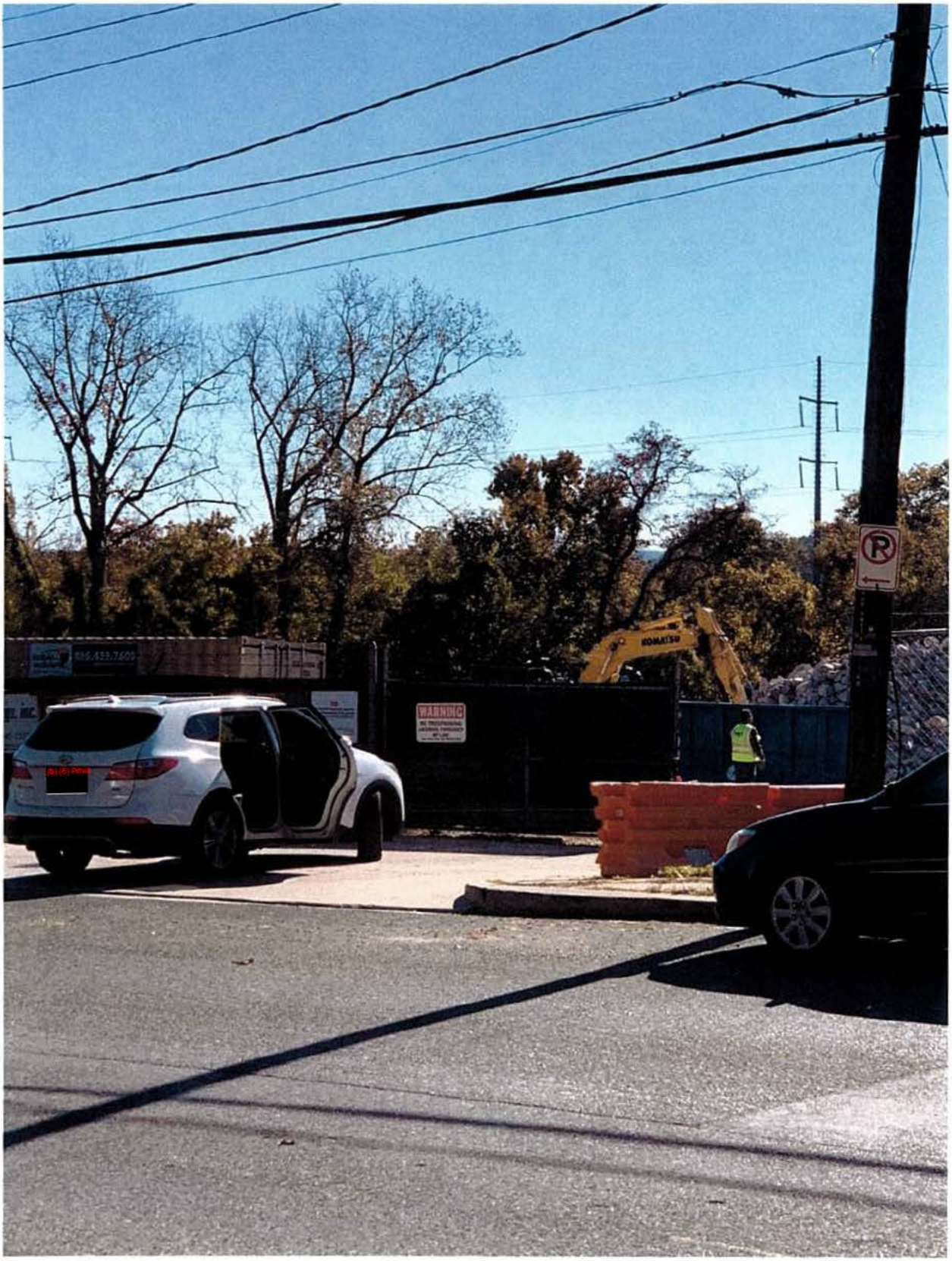
MPH Practicum students supervised (all EOH at GWU):

2021	1 student: [redacted] (at GWU)
2020	1 student: [redacted] (at GWU)
2017	2 students: [redacted] (at Environmental Health Analytics, LLC)
2016	2 students: [redacted] (at Environmental Health Analytics, LLC)
2015	2 students: [redacted] (at U.S. Chemical Safety Board)

Undergraduate

[redacted]

Complainant's Exhibit B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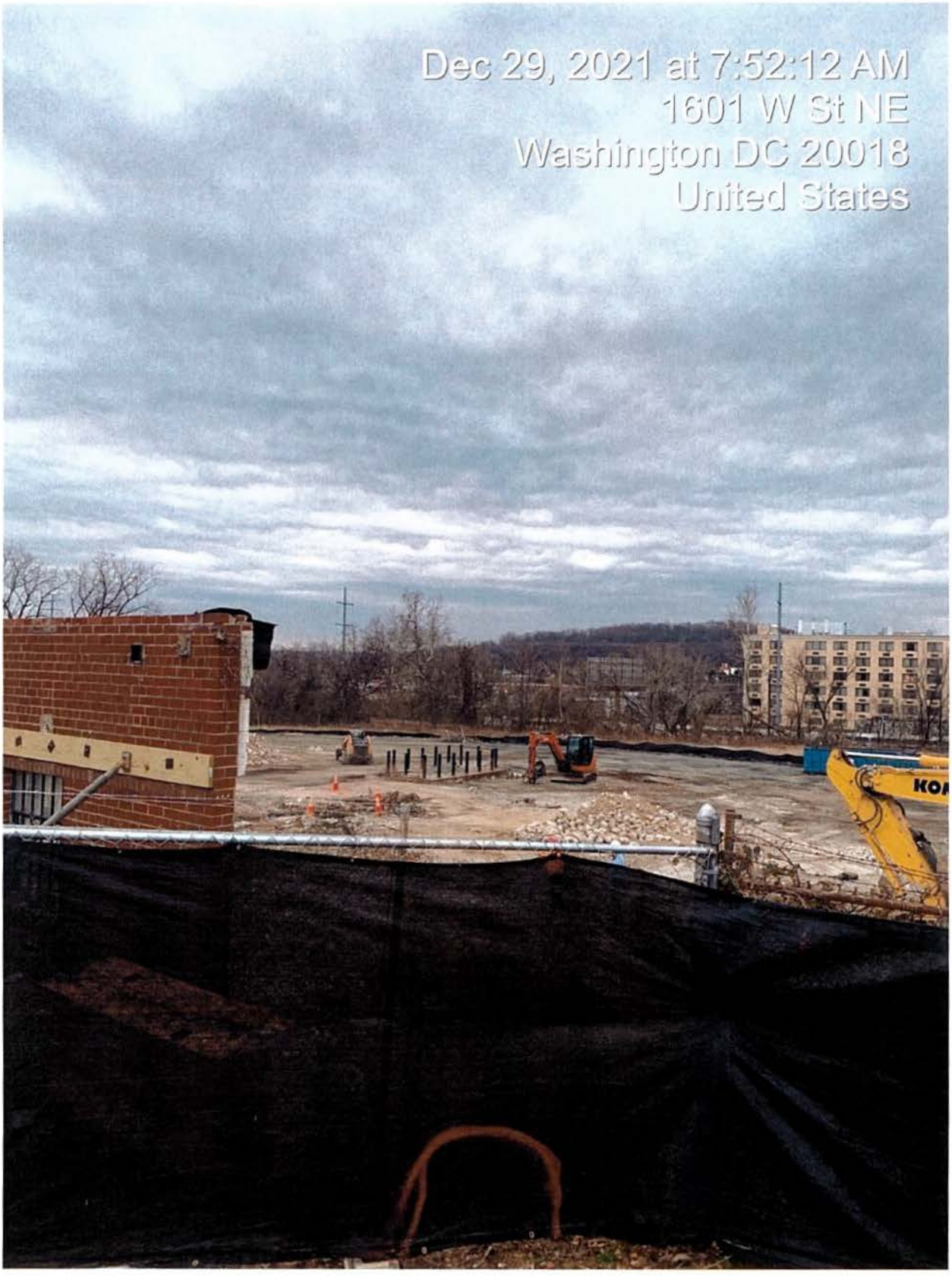
These photos and videos seen later in this multi-page Exhibit, taken over time, at different times, which demonstrate the noise, the big truck traffic, the heavy construction machinery and the dust and toxic air pollution occasioned by this preliminary construction and visited upon Plaintiffs, who witness this construction from their windows. These images also demonstrate the deception of the Defendants; carrying out the construction, while telling Plaintiffs and other Brentwood residents that no final decision had been made about locating the Bus Depot in Brentwood.


R
B
S

These are additional photos, taken over time, at different times, which demonstrate the noise, the big truck traffic, the heavy construction machinery and the dust and toxic air pollution occasioned by this preliminary construction and visited upon Plaintiffs, who witness this construction from their windows. These images also demonstrate the deception of the Respondents; carrying out the construction, while telling Complainants and other Brentwood residents that no final decision had been made about locating the Bus Depot in Brentwood.


16 ST NE
2200
W
500


Dec 29, 2021 at 7:52:12 AM
1601 W St NE
Washington DC 20018
United States


al_-9.jpg


Environmental_-17.jpg
Jan 23

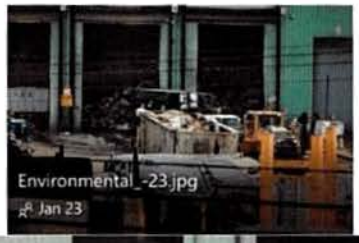

Environmental_-18.jpg
Jan 23


Environmental_-19.jpg
Jan 23


Environmental_-20.jpg
Jan 23


al_-21.jpg

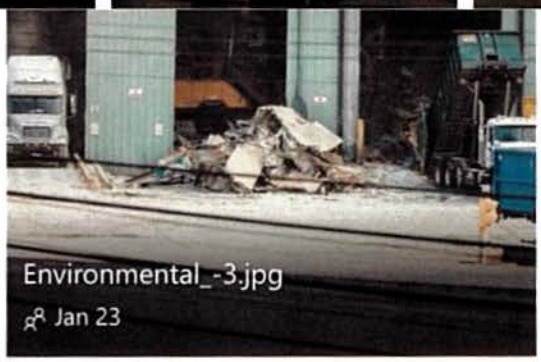

Environmental_-22.jpg
Jan 23


Environmental_-23.jpg
Jan 23


Environmental_-24.jpg
Jan 23


Environmental_-25.jpg
Jan 23


RSI
vironmental_-2.jpg
Jan 23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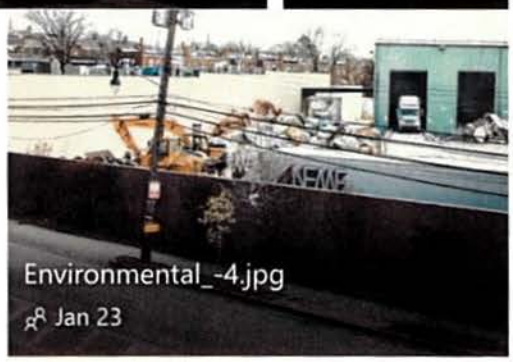
Jan 23


Environmental_-4.jpg
Jan 23


BAYER
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Jan 23


W. R. BRAXTON
Environmental_-8.jpg
Jan 23


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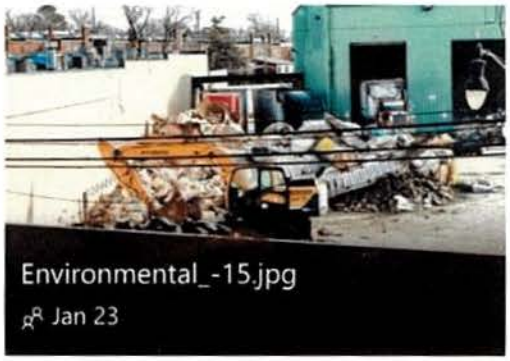
an 23


Environmental_-14.jpg
Jan 23


Environmental_-15.jpg
Jan 23

9330000
Utility M
10" x 14

Pleas

Visit US

FROM:

[redacted] Johnny Barnes
301 G Street SW
Washington D.C.

PLACE STICKER AT TOP OF ENVELOPE TO THE RIGHT OF THE RETURN ADDRESS, FOLD AT DOTTED LINE

CERTIFIED MAIL®

(b) (6) Privacy, (b) (7)(C) Enforcement Privacy

Utility Mailer
10 1/2" x 16"

MAY 18 2022

TO:

JuanCarlos M. Hunt, Esquire
Director, Office of Civil Rights
Office of General Counsel (2310A)
1200 Pennsylvania Ave., NW, WCJN
Room 2524 Washington, D.C. ~~20460~~ 20460

~~7324A~~

524A - Lilian Dorka

Rea